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THE UNIVERSITY OF ALBERTA

THE EFFECTIVENESS OF INSTRUCTION AND REINFORCEMENT ON SELF-MEDICATION ROUTINES OF OLDER ADULT PATIENTS

by

Donna Jane Pickard

A THESIS

Submitted to the Faculty of Graduate Studies & Research

In Partial Fulfillment of the Requirements for the Degree

Master of Nursing

Faculty of Nursing

Edmonton, Alberta

Fall 1987

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THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and research for acceptance, a thesis entitled The Effectiveness of Instruction and Reinforcement on the Self-Medication Routines of Older Adult Patients, submitted by DONNA JANE PICKARD in partial fulfillment of the requirements for the degree of MASTER OF NURSING.

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Date: 4 June 1987

ABSTRACT

The purpose of this study was to examine and monitor the effectiveness of instruction and reinforcement on knowledge of prescribed drugs and adherence to self medication routines of adult medical patients over 55 years of age discharged from a large teaching hospital in Southwestern Ontario. The effect of instruction on knowledge level was assessed according to measurement criteria developed by Horn and Swain (1977).

Sixty subjects, randomly assigned to test and control groups, participated in this clinical field study, divided into three groups. All subjects were pretested prior to discharge from hospital and posttested and monitored for adherence to the prescribed routine one month post discharge. Both test groups received detailed instructions and booklets about two of their medications from a nurse researcher. In addition, one group had the instruction reinforced via telephone two weeks post discharge.

None of the hypotheses were statistically supported. A directional trend toward an increase in scores for the group receiving structured teaching and reinforcement was noted. A significant difference was shown between pretest and posttest scores for both treatment groups but not the control group, using paired t-tests.

It was demonstrated that patients who had drug instruction and reinforcement and those who had drug instruction reported greater adherence to the prescribed routines than those who had no detailed instruction. A Pearson Product Moment Correlation Coefficient showed a significant relationship between higher knowledge levels and adherence

to routines.

Using Chi Square and Pearson Product Moment Correlation Coefficients it was demonstrated that those subjects living with a spouse or their families scored higher on the posttest than those who lived alone. Younger patients tended to score higher than older patients and those individuals with high school education or more tended to score higher than those with less education on both pre and posttests.

The results of this study are of interest to clinical nurses in hospitals, nurse administrators, community nurses and nurse researchers.

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I wish to highlight a few very special individuals whose guidance, assistance and encouragement have made the completion of this study a reality. Thank you to Dr. Peggy Anne Field, my thesis committee chairman for sharing her research expertise, for her time critiquing my work and her faith in me that I would accomplish my goal; to Dr. Janet Kerr and Dr. Gordon McIntosh, my thesis committee members, for their contributions to this study and their patience and willingness to accommodate my time schedule; to Dr. Kris Kirkwood and Dr. Janice Lander for their assistance with my statistical analysis; a special thank you to the Head Nurses and staff on the nursing units at Victoria Hospital in London, Ontario for their cooperation and assistance during the data collection phase and to my colleague and friend, Bonnie Adamson for her moral support and consideration in the workplace that allowed me the necessary time to complete this study.

To type a manuscript such as this study is an awesome task and my typist, Ann Hinman met this challenge superbly. I thank her for her patience, flexibility and adept word processing abilities.

Last but not least, I wish to express my gratitude to my Mom and Dad for their love, support and encouragement over the years and especially during the final stages of this degree.

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CHAPTER I

The Effectiveness of Instruction and Reinforcement on the Self-medication Routines of Older Adults

Introduction:

Recent studies indicate that 30% to 60% (Becker and Maiman, 1980) of patients do not adhere to prescribed medical regimens of care. Many reasons have been postulated and investigated, with no conclusive findings. One of the reasons frequently used in reference to the problem of not adhering to the medication regimen is lack of information about drug use and misuse. When responsibility for self medication is given to patients, with it must go information, instruction and practice to ensure safe self-medicating.

Because the older adult population takes many drugs for a multitude of medical conditions, education programs geared to their needs could potentially have many benefits. Compliance rate in this group ranges from 20% to 80% (Pagliaro, 1983) thereby raising questions about the efficacy of care and treatment. In order to allow as many of these older people as possible to remain in their own homes (currently 90% are in their own homes; Brock, 1980) and to prevent hospital admissions and re-admissions and maintain a satisfactory life-style, health professionals must explore ways to guide and support this age group. It is necessary to bring about change in their drug taking behaviour

resulting from new information given and the experience gained in using this knowledge. It is essential that services be designed to strengthen the existing assets of the group and prevent avoidable health problems (Neufeld, 1985).

The implementation of the concept of self-care, when used with the older adult population allows this group to gain and retain control over its health destiny. Information and reinforcement is provided allowing these individuals to understand themselves and their bodies in order to make informed decisions about their health care. Reasons for not following medical regimens then become matters of choice and capability rather than lack of understanding or ability.

Redman (1984) using recent reviews as her reference divided the population into thirds in her attempt to explain patient behaviour, one third adhered to the treatment plans as ordered, one third had every intention of following the orders but due to misunderstanding adhere to the wrong treatment plan, and another third of the population were knowingly non-compliant.

Purpose and Research Questions

The purpose of this study was to examine the effects of instruction, reinforcement and follow up monitoring on knowledge of prescribed drugs and adherence to self medication regimens with older adult patients (admitted with a medical condition) following discharge from a hospital setting. The one third of the population according to

Redman's (1984) grouping that are most likely to follow instructions, required initial teaching. The one third who are willing to follow instruction if they understand the treatment plan required instruction to ensure that their understanding was correct. The one third who are knowingly non-compliant required instruction so they were informed about what they were refusing.

The following research questions were addressed:

1. What are the effects of instruction on knowledge of drugs and drug routines used in self-medication regimens by older adult patients discharged from the hospital?

2. What are the effects of reinforcement of teaching via telephone follow-up on knowledge of drugs and drug routines used in self-medication regimens by older adult patients discharged from the hospital.

3. What are the effects of instruction and reinforcement on adherence to routines, as measured by subjective (interview) and objective (pill count) monitoring, by older adult patients discharged from the hospital?

Hypotheses

For this study the following hypotheses were formulated:

1. Patients who are given a program of drug instruction will show greater knowledge of drugs than those who do not have such a program of instruction.

2. Patients who are given a program of drug instruction and telephone reinforcement will show greater knowledge of drugs than those who do not have telephone (instruction) reinforcement, and those who do not have a program of instruction.

3. Adherence to self-medication regimens will be greater in those who receive a program of drug instruction than those who do not have such a program of instruction.

4. Adherence to self-medication regimens will be greater in those who receive a program of drug instruction and telephone reinforcement than those who do not have telephone reinforcement, and those who do not receive a program of instruction.

Operational Definitions

Knowledge: - theoretical or practical understanding to be measured by scores on a questionnaire on medication knowledge, developed by Horn & Swain (1977).

Instruction Program: - written and oral information about prescription drugs, given by nurse researcher (Printed summaries of instruction left with patients).

Monitoring: - listening to and reporting on drug routine adherence to be done through interview with subjects and by pill count.

Medical Teaching Unit: - a nursing unit in a hospital affiliated with a university where patients with a medical condition are cared

for by qualified health professionals and by students of the health professions.

Reinforcement: - verbal support, suggestions and repetition of the same data given in the instruction program, to be given via telephone approximately two weeks after discharge from hospital.

Medication: - used synonymously with drug; a pharmaceutical preparation in the category of diuretics, nitrates, oral hypoglycemics, anticoagulants, beta adrenergic blocking agents, and digitalis medications.

Pretest: - a set of questions designed to measure the patient's knowledge level, administered by structured interview, prior to the patient's discharge from hospital.

Posttest - a repeated administration of the pretest questions by structured interview four weeks following hospital discharge.

Self-care: - deliberate actions initiated and performed by an individual on his/her own behalf to maintain life, health and well being. (Orem, 1980)

Ethical Considerations

Because the study was an investigation involving human subjects, directed to the advancement of nursing knowledge, the following ethical considerations were addressed.

Scientific Merit of Study: The purpose of this study was to explore and validate ways in which nurses can assist older adults to safely and

correctly take their own medications and thereby maintain themselves in their own environment.

Consent/Confidentiality/Protection of Participants: Subjects meeting the criteria for this study were asked to sign a consent form (Appendix A) and were assured that information gained was confidential and that in no way would that information be connected with the individual in written or verbal reports of the study findings. The purpose of the study was briefly explained by the investigator both in the preamble of the informed consent and verbally when consent was obtained.

Patients were randomly assigned by using a table of random numbers for assignment to control and experimental groups, which were numbered one, two and three by random draw. If any patient had demonstrated a knowledge level at pretesting that could be considered injurious to his/her health, he/she would have been excluded from the sample and provided with the information package but this did not occur. All patients in the control group received instruction and the information package after posttesting. Records of incidents requiring patients to withdraw or be withdrawn from the study were kept and reported with the findings.

Setting: This study was carried out on four adult teaching medical units in an acute care hospital prior to the subject's discharge. Prior to any experimental intervention the subjects received the informal, unstructured pre-discharge teaching that was standard for these units. The staff were thoroughly briefed about the purpose, the

methods and their role, prior to the commencement of the study.

Delimitations of the Study: It was recognized that knowledge increases do not necessarily translate into behavioural changes. Although some attempt was made to monitor adherence (using pill counts and interview) to determine if there was a correlation between increased knowledge and adherence to regimens, this proved impossible to measure due to the lack of reliability of the pill count.

Correlated errors from the pretest to the posttest were recognized as a possibility with this design. The possibility of test sensitivity was also noted because subjects were given the same questions at pretest and posttest. The Hawthorne effect produced by the extra attention given during teaching and by telephone reinforcement may have affected the results of the study.

History and maturation would have little effect on the internal validity of the study because the subjects were adult patients and the testing was completed within one month. Regression to the mean was noted in the findings with the extreme scores on pretesting falling closer to the mean on posttesting, because there is some degree of unreliability in any measurement device and the first and second measures are not perfectly correlated.

Subjects must have met certain criteria so they were not selected from the entire hospitalized population at random. Randomization occurred in assignment to control or experimental groups. It was assumed that any variable that would affect the experimental groups

would also affect the control group because the nursing units from which the subjects were selected were similar.

CHAPTER II

REVIEW OF THE LITERATURE

Conceptual Framework

The theoretical framework for this study was derived from Orem's self-care theory. It is an appropriate model to use to study how patients can be taught to perform their own health care to the best of their abilities. Self-care behaviours are not merely compliance behaviours. Compliance behaviours are said to occur when the patient obeys the doctor's orders, whereas self-care actions are those initiated by a person with the goal of restoring or maintaining health, patients are doing more than conforming to a norm (Harper, 1984).

The necessary prerequisites for self-care include knowledge about health, motivation for health behaviours and the ability to initiate and to perform self-care behaviours (Orem, 1980). There are also a number of other conditioning factors such as age, sex, developmental status, health state, availability of resources, socio-cultural status and relevant life experiences, that Orem describes as affecting self-care abilities. When the patient's self-care system is limited, deficits result and a need for nursing exists. Usually the self-care system of individuals is sufficient to meet the demands placed on it but when the person is faced with new health care situations requiring adaptation or alternate health behaviours, often as-

sistance is required (Harper, 1984).

The conditioning factors of age (over 55 years), health state (able to maintain self at home without motor or sensory deficits)and developmental status (able to receive instruction and carry out self-care behaviours in own home) were considered in the selection criteria for this study. As well the conditioning factors of availability of resources, sociocultural status and assessment of relevant life experiences are factors in determining the focus of the instruction given and the emphasis placed on certain aspects of the teaching. Although not directly measured, the skill and motivation level of the subjects was indirectly ascertained when the percentage of errors in the regimens was known, as the measure of adherence.

The self-care model emphasizes the unique perspective and strength of each individual patient, thereby fostering autonomy and responsibility,which are necessary for long term results in decision-making and behavioural change (Neufeld, 1985). Proponents of self-care insist that the motivation to improve adherence to medical regimens would be enhanced if patients were more knowledgeable about their disease and had some skill that was relevant to their participation in their treatment (Kerr, 1985).

Self-Medication and Adherence to Routines

A number of authors have looked at the topic of self-medication in the elderly (Table 1), striving for similar purposes - to determine

what health care professionals can do to ensure that the elderly do understand and take their medications. The studies use a variety of methods and while many offer recommendations for further study, there are no findings which indicate the best practice to follow to ensure that self-care behaviours will be carried out. Studies have been conducted to explore the relationship between a client's knowledge of and adherence to medication regimens, with findings indicating that non-comprehension and lack of understanding result in less accurate self-medication behaviours. (Parkin, 1976; Lundin, 1978; Cole & Emmanuel, 1971; Plant, 1977; Fletcher, 1979). These researchers tested knowledge levels prior to some form of instruction and found that the subjects demonstrated that they had inadequate information to safely carry out the prescribed medication routine.

Many of the researchers studying this problem have encountered measurement difficulties. The simplest way to measure compliance with medication routines is by self report or interview. It has been found that following interview, when more objective tests were carried out, such as pill counts or blood and urine tests, that patients tend to over-report medication taking in interviews. (Parkin, 1976; Neely & Patrick, 1968; Cole & Emmanuel, 1971; Marston, 1970; Hilbert, 1985; McPhee, 1983). Hecht (1974) used both interview and objective measures and found the interview to be the least effective method of monitoring adherence to drug taking routines.

Table 1

Summary of Literature by Broad Category of Study

Authors	Broad Categories of Content Studied						
	Lack of understanding of medical regimen	Over report of adherence to regimen	Measurement difficulties due to confounding and interaction effects	Complexity of Regimen lead to decreased adherence	Effects of teaching on adherence	Effects of specific teaching and contracting	Labelling and instruction on medication bottles
Ascione	*			*			
Bream					*		
Christensen			*				
Cole & Emmanuel	*	*				*	
Felsenthal					*		
Fletcher	*			*			
Galton						*	
Gibb	*						
Harper						*	
Hecht		*				*	
Hilbert		*					
Johnston					*		
Kim					*		
Lundin	*						*
MacGuire	*						
Malahy				*	*		
Marston		*	*				*
Milazzo						*	

Table 1 (continued)

Summary of Literature by Broad Category of Study

Authors	Broad Categories of Content Studied						
	Lack of understanding of medical regimen	Over report of adherence to regimen	Measurement difficulties due to confounding and interaction effects	Complexity of Regimen lead to decreased adherence	Effects of teaching on adherence	Effects of specific teaching and contracting	Labelling and instruction on medication bottles
Moughton						*	
Murray				*			*
Neely & Patrick		*		*			
Neufeld						*	
Norell						*	
Parkin	*	*		*			
Plant	*						
Ridout					*	*	
Schwartz			*	*			*
Steckel						*	
Vincent			*				

A search by many researchers for a character profile of the "medication- taker" and the "medication - defaulter" identified no statistically significant characteristics. Variables such as age, sex, race,education level and living arrangement have been studied. The only significant finding was by Schwartz (1964) who found a significant relationship between living alone and low drug taking compliance. When Marston (1970) reviewed the literature she found no significant associations in the studies she reviewed. Noncompliance with medical regimens in 25% to 50% of patients were noted in all age groups, all disease states and all socioeconomic backgrounds in a review conducted by Christensen (1978). Vincent (1971) faulted other studies for dealing with the variables one at a time and suggested that pairing of variables (ie. age and sex) would result in finding some predictors of non-compliant drug taking behaviour, as this would reduce the interaction effects of the variables.

A high correlation between complexity of the regimen and non-compliant behaviour has been reported. (Parkin, 1976; Schwartz, 1975; Malahy,1966; Neely and Patrick, 1968; Fletcher, 1979, Ascione et al., 1986). Many of the older patients had a number of prescribed medications, in addition they take over-the-counter medications and some further complicate their own regimen by taking outdated medications. The universal finding in these studies was the more drugs, the more errors.

Patient Teaching

The importance of teaching patients about their medications has been the focus of many studies. Harper (1984) looked at teaching self-care behaviours and found increased compliance. Bream (1985) reported on a self medication training program in a British setting where the group taught to self medicate while in hospital scored higher on knowledge tests than the control group, which did not self medicate. Malahy (1966) was unable to prove that teaching helped but suggested further study because the author had a strong feeling that perhaps it was the type of teaching that would show significant results. Kim's (1981) study related to teaching, specifically addressed the learning needs of the elderly and showed their lack of ability to take in information quickly but indicated increased success with slower paced teaching. Moughton (1982)and Steckel (1982) emphasized involving the patient in the teaching via contracting, agreeing with Norell (1975), Galton (1976), Hecht (1974),Cole and Emmanuel (1971) and Neufeld (1985) that tailoring the teaching plan to the patient's individual needs and gaining his/her cooperation increased the likelihood that the routine would be followed. Felsenthal et al. (1986) reported that environment conducive to teaching was a significant factor. Elderly patients have difficulty coping with excessive, external stimuli and chances for learning are better when the patient is in a quiet, relatively distraction free setting. Milazzo(1980) found that formal teaching resulted in greater increase in knowledge than informal teaching, yet informal

teaching constituted the bulk of teaching that most patients received.

The use of the telephone as a valuable communication tool that can enhance patient teaching, assist in information gathering and aid in detection of potential patient problems was found to be effective by Zimney (1980) and Steven (1985). In Steven's (1985) study, she suggested that patients have many questions and concerns once they have been discharged from the hospital and that they are able to continue to learn with instructions via the telephone once they are at home.

The survey carried out by Ridout et al. (1986) revealed that most patients need to have more information about prescribed drugs, especially their unwanted effects. They found that 83% of respondents thought that an information leaflet would be helpful to provide information about their medications.

Written instructions and labeling details on medication bottles where shown in Lundin's (1980) study to improve adherence to regimens. Numerous studies investigating a variety of self-help devices such as calendars and pill dishes have been carried out to determine their effectiveness in increasing drug taking behaviour (Lundin, 1980; Marston, 1970). Having the medication bottles in front of the patient for teaching during the interview and doctor's office visits, to provide concrete examples in the form of visual aids was found to be effective by Schwartz (1975) and Lundin (1978).

Beliefs and Perceptions of Health:

Many researchers have looked at adherence to drug routines within the context of the health belief model (Becker, 1976; Christensen, 1978). It is believed that when patients perceive themselves susceptible to disease or that the disease is serious, they are more likely to be compliant. Marston (1970) found this in a number of cases, as did Hecht (1974) who found that the more severe the illness, the more likely the patient was to take medications as ordered. The converse has also been found in that sector of the population suffering from chronic disease who perceive themselves to be more seriously ill or more susceptible to illness. They develop a fatalistic approach and do not follow the treatment plan. In these cases, education about the disease appears to have a negative effect on adherence (Kerr, 1985).

Sick role theory is also discussed in many studies, with its rights and obligations for the sick person and obligation but lack of rights for the "at-risk" person (Christensen, 1975). Those patients who have no symptoms tend to discontinue medications prior to stop date (Schwartz, 1975; Hahn, 1986), fail to get the prescription filled (Hahn, 1986), decide they do not need the medication as often as ordered (Lundin, 1980) or due to the chronicity of the condition, see no point in taking the medication for the rest of their lives (Brock 1980). Length of time under treatment and reduction in compliant drug taking behaviour was evidenced in Marston's (1970) review.

Summary

While many researchers have studied the problems of self-medication routines and many have written articles or conducted symposiums, non-adherence to the prescribed regimens is still a major problem in our health care system. Diagnostic and therapeutic efforts are of little value unless the prescribed regimen is understood and followed by the patient (Norell, 1975). There has also been considerable discussion about who should play the major role in assisting the older population to become more competent self medicators (Moore, 1978; Cole and Emmanuel, 1971; Spector, 1978) with some favouring the pharmacist due to his knowledge of the medications and some the nurse due to her twenty-four a day involvement with hospitalized patients and ability to assess, plan, implement and evaluate the care and teaching given to patients as they strive to become more self-reliant. Johnston's (1986) study showed that any member of the usual clinical team (physician/pharmacist/nurse) can improve knowledge about medications by counselling and thereby greatly increase the opportunity for intended compliance when the patient gets home.

In the Canadian Nurses' Association (1985) Standard III it is made clear that nurses have a responsibility for patient teaching. The nurse must be able to assess what her patient understands, what it is reasonable to teach the patient and then do so in a way that is meaningful for the patient. The literature supports the use of written in-

formation (Redman, 1984) and past research has shown that formal teaching results in a greater increase in knowledge than informal teaching (Milazzo, 1980). For these reasons a standardized teaching program was included in this study as one of the experimental interventions to increase patient's knowledge about their medication routines.

This study addressed how nursing can meet that standard through patient teaching plans that include instruction, reinforcement and monitoring. The design was such that random assignment was used to control for intervening variables. Because the questionnaire being used had been subjected to considerable testing for reliability and validity both in the developmental stages and in later use, greater confidence can be placed in the results of this study when contrasted with earlier studies which did not use such a rigorously tested instrument. This study combines teaching, reinforcement and follow-up monitoring to measure effectiveness and was more comprehensive than previous studies. Based on the recommendations made by other researchers, initial instruction was tested in this study, reinforcement of teaching was used and adherence was monitored, thereby overcoming the evident flaws in other similar studies addressing the problem of non-adherence to medication regimens.

CHAPTER III

METHOD

In the study, a quasi experimental design was employed. There were three groups - a control group, an experimental group that received instruction about their prescribed medications and an experimental group that received instruction and telephone reinforcement. The sample size was 60, with 20 subjects in each group. In this section the population and sample, instrumentation, method of data collection and data analyses are presented.

Population and Sample

The study was carried out in a large teaching hospital in southwestern Ontario, on four adult medical units (Unit A [30 beds], Unit B [14 beds], Unit C [20 beds], and Unit D [30 beds]). While patient teaching is an expectation of registered nurses on these units, it takes the form of unstructured and informal teaching and is the responsibility of the nurse assigned to the patient for a particular shift. The teaching skills of the nurses on these units and the time available for teaching vary.

Contact was made with patients on the unit and following a verbal explanation of the study, a written consent was obtained by the nurse researcher from patients deemed eligible for the study by the head nurse and nursing staff who had continued contact with the patient

during his/her hospital stay and knew his/her self-care abilities and limitations.

All patients admitted to the four adult medical units used for the study were considered eligible for the study if they met the criteria outlined in Appendix B. Three subjects who met the criteria refused to be a part of the study, indicating that they had no intention of following the routine precisely once they returned home. Several more, even though they agreed to participate in the study made several comments suggesting that they too could be a part of the one third non-compliant population. Once consent was obtained the patient was assigned a number between one and sixty, according to when they entered the study. A table of random numbers was used to determine whether the patient was in one of the experimental groups or the control group, which were numbered one, two and three by random draw.

Instrumentation:

The pretests and posttests were based on criterion measures of nursing care formulated by Horn and Swain (1977), and developed using the conceptual framework for nursing practice outlined by Orem (1977). The measures selected for this study comprise one from a subset that address the issue of medications, from Horn and Swain's criterion measures of nursing care instruments. The questions selected focused on patients' knowledge of medications, in this case, those prescribed during their hospitalization and continued at home after discharge.

The instrument was designed to be administered by an interviewer. Inter-observer reliability for 109 out of 414 quality measures had been established by Horn and Swain. Criteria established for the final determination of reliability were (1) a sample reliability index of at least .80 (2) confidence interval of 95% and (3) lower bound of the confidence interval to exclude the reliability index of .60. An additional 171 measures either met two of the three criteria or had no confidence bounds determined due to absolute agreement (r=1.00). One hundred and eight of the measures needed further testing because inter-observer reliability was not established for these measures, but none of these measures were in the subset used in this study. Content validity was established for all 539 measurements using the technique of Nunnally and Durham (1975). This technique was based on two criteria - that the items in the instrument were representative of the domain to be utilized in the instrument and the design of the measures themselves utilize "sensible methods" of construction. The sample in this study was sufficient to determine whether the treatment had a medium effect with a 0.5 power level (Cohen 1977).

Selection of the Questions

Orem (1980) describes both universal self-care requisites and health deviation requisites. The universals are conditions that have to be met by all human beings in their day to day functioning. The health deviation requisites are for individuals who are ill or injured

and are necessary for return to their optimum health level.

Because this study was designed for patients being discharged from hospital after an illness, the questions were selected from the health deviation measures of nursing care developed by Horn and Swain (1977). Based on the literature the self-care deficit for this group of patients was assumed to be knowledge so the questions about medication knowledge were selected for inclusion in the pretest and posttest questionnaire (Appendices C and D). The questions were reviewed by three registered nurses, with expertise in the care of adult medical patients, for clarity, relevance to this population and completeness of each section to gather the information necessary for the study.

Scoring of the Instrument

A total of forty nine questions about medication knowledge were selected for inclusion in the pretest and repeated with slight modifications for past tense, in the posttest. Patients were tested on the two medications most recently ordered by the doctor prior to discharge from the hospital. The medications were restricted to the following drug groups: - digitalis, anticoagulants, diuretics, beta adrenergic blocking agents, vasodilators/antianginals and oral hypoglycemics. Patients were asked about the drug name, how much medicine they should take, how the drug works, any food, fluid or activity considerations associated with the drug, missed doses, side effects and how to cope with them and how long they should expect to take

the drug.

The questions selected for the pretest and posttest interview were paired with acceptable answers and the criteria were set for what entails a complete and incomplete response in those questions requiring more detailed answers (Appendix E). The specific directions for scoring the patient knowledge results were based on those developed by Horn and Swain (Appendix F).

For purposes of analysing the data from the pretest and posttest interviews, a value was assigned to the response choices. Responses deemed to be correct were given a value of 1, responses that were mixed with some aspects correct and some incorrect were given a value of .5 and responses of "doesn't know," "irrelevant " and those deemed to be incorrect were assigned a value of 0.

Data Collection

Patients taking part in the study were interviewed (pretest) by the nurse researcher, as soon as discharge plans were known. The nurse assigned to care for that patient had completed the teaching that was standard for that nursing unit. Because informal teaching plans vary from nursing unit to nursing unit, as does the time spent teaching and the expertise of the individual, this variability in informal teaching (from very adequate to very little) could not be controlled and was therefore assumed to be a random factor across groups. Once the pretest interview was completed the nurse researcher administered the

teaching packages related to the two drugs about which questions were asked in the pretest interview to individuals in both of the experimental groups to which the subjects had been randomly assigned.

The patients in both of the experimental groups received instruction and printed packages of material about their two most recently ordered drugs, prior to discharge. Appointment times for the nurse researcher to come to the patient's home were established and a card containing her name and telephone number and the appointment date was given in the event that the patient needed to change the arrangements. The patients in the experimental group who were to receive instruction via telephone reinforcement at two weeks post-discharge were told this and a mutually agreeable date and time for the call was established. Any intervention post discharge other than the telephone reinforcement using the teaching packages, was not controlled. The extraneous variables such as a home care visit at one week post discharge to appraise coping, verbal explanation from the dispensing pharmacist, assistance from a family member with health care training and previous experience with a self medication routine varied and were assumed to be a random factor across groups.

At the time of the interview in the patient's home at one month after discharge from the hospital, the posttest questionaire was completed. As well, some demographic information (Appendix G) was collected from each of the subjects for use in a secondary analysis of the data. At that time the patients were asked whether they had taken

their drugs as prescribed, and because the literature indicates that subjective reporting is not reliable, the pills were counted in an attempt to verify their report and to determine the percentage of error in their adherence to the prescribed regimen.

Content and Face Validity of Teaching Packages

Teaching booklets (Appendix H,I,J,K,L,M) on the six medications included in the study were typed in large easily read print with different coloured title pages for each medication.

The face validity of the booklets was checked with four older adult patients for clarity and readability. The information booklets were validated for content by four registered nurses with expertise in medical nursing, a clinical pharmacist, and a physician.

Instruction and Reinforcement of Instruction

After the patients in the study were pretested, the nurse researcher provided detailed instruction about the two most recently prescribed medications that they would continue to take when discharged home. The instruction was given in the patient's room at a rate of speed with which the patient was comfortable. (This was determined by the nurse researcher giving the instruction, based on feedback from questions and expressed acknowledgement by the patient). It was estimated that the teaching time for the material would take approximately 30 to 40 minutes. Ample opportunity was given for the sub-

jects to ask questions and for clarification of the content in the teaching booklets. Booklets containing the drug information were to be taken home by the patients in the experimental groups who received instruction and they were given to the control group on completion of the study. Patients in the telephone reinforcement group were asked to have the information packages about their drugs at the telephone with them when the repeat instruction was given. Again, ample opportunity to ask any questions about their drugs was provided during the telephone session.

The reasons that a one-on-one instruction method was used were many. It is possible in a controlled environment where distractions can be minimized to present the material in a personalized way. Consideration for the learning needs of older adults were heeded by allowing for variations in the pacing of the presentation. Also an interactive process utilizing feedback and providing time for evidence of understanding to be expressed, was implemented. Time could be set aside when the patient was receptive to learning and because printed individualized booklets were left with the patient, learning could continue after the formal instruction had ended.

Design

Figure I - Design of the Study

	Pretest	Instruction	Reinforcement	Posttest
Group I	0	X_1		0
Group II	0	X_1	X_2	0
Group III	0			0

0 = pretest and posttest

X_1 = detailed instruction

X_2 = telephone reinforcement

Data Analysis

The data generated from this study were entered on to a VAX 11/750 computer after they had been scrubbed and verified. All of the analyses were conducted using a statistical package called SPSS$^{\times}$ (1983).

The following statistical techniques were utilized for the data analysis. First the demographics were presented in frequencies and percentages. Next, Pearson's product moment correlation coefficient

techniques were used to examine the relationship between the variables of knowledge (as measured by pre and posttest score) and gender, age, living arrangement, education level, use of pill device, number of regularly prescribed prescription drugs taken and adherence to medication routine. Then, Chi Square calculations were done to evaluate whether or not frequencies which have been empirically obtained differed significantly from those which would be expected under a certain set of theoretical assumptions. Finally, an analysis of variance was used to examine mean differences across the three groups and a test for homogeneity of variances among the groups was employed. A paired t-test was done to examine mean differences from pretest to posttest for each group. Results were considered significant at the .05 level.

CHAPTER IV

RESULTS

Characteristics of the Sample

Sixty patients participated in this quasi experimental field study equally divided into three groups of twenty subjects. Treatment Group I received structured teaching about two of their medications prior to discharge from hospital and were given printed booklets containing information about the two drugs. Treatment Group II received structured teaching and booklets, the same as Group I, and in addition received telephone reinforcement of the information two weeks post discharge from hospital. The Control Group received the discharge teaching that was standard for the inpatient unit where they were hospitalized (and received the structured teaching and booklets only after the posttest interview was completed). Characteristics of the sample are contained in Table 3 and Table 4.

Prior to posttesting at one month after discharge from hospital four patients were eliminated from the study. Three were due to death and one due to readmission to the hospital (Table 2).

Table 2

Attrition from the Study of Gender and Group

Gender	Treatment Group I	Treatment Group II	Control Group
Female	1	0	0
Male	1	1	1

Table 3

Characteristics of the Total Population - Frequencies and Percentages

Variable	Frequencies	Percentages
Category		
Treatment Group I	20	33.3%
Treatment Group II	20	33.3%
Control Group	20	33.3%
Gender		
Female	27	45.0%
Male	33	55.0%
Living Arrangement		
Alone	18	30.0%
With Spouse	33	55.5%
With Family	9	15.0%
Education Level		
Less than Grade 8	9	15.0%
Grade 8	35	58.3%
High School Graduation	9	15.0%
Post Secondary	7	11.7%
Number of Drugs Taken		
Two	3	5.0%
Three	18	30.0%
Four	24	40.0%
Five	15	25.0%
Use of Pill Device		
Yes	19	31.7%
No	41	68.3%
Adherence to Routine*		
All of the Time	24	40.0%
Most of the Time	28	46.7%
Some of the Time	4	6.7%

* 4 Cases missing due to inability to posttest.

Table 4

Characteristics of the Sample by Groups

Variable	Treatment Group I	Treatment Group II	Control Group
Category	20	20	20
Gender			
Female	10	7	10
Male	10	13	10
Age			
Range	55-81	55-77	55-81
$\bar{X}$	68.6	66.6	71.3
Living Arrangement			
Alone	4	4	10
With Spouse	12	13	8
With Family	4	3	2
Education Level			
Less than Grade 8	5	3	1
Grade 8	10	13	12
High School Graduation	3	2	4
Post Secondary	2	2	3
Number of Drugs Taken			
Two	1	1	1
Three	5	9	4
Four	9	8	7
Five	5	2	8
Use of Pill Device			
Yes	7	4	8
No	13	16	12
Adherence to Routine			
All of the Time	7	8	10
Most of the Time	10	8	9
Some of the Time	1	3	0

The mean age for the sample was 68.8 years, with a range from 55 to 81 years. The range and mean age in each of the groups was as follows: treatment group I, range 55 to 81 years with a mean age of 68.6 years; treatment group II, range 55 to 77 years with a mean age of 66.6 years; control group, range 55 to 81 years with a mean age of 71.3 years. There were 27 females (comprising 45% of the sample) and 33 males (comprising 55% of the sample). Thirty percent of the sample lived alone, 55% lived with spouses and 15% lived with their families. Fifteen percent of the subjects had less than a Grade 8 education; 58.3% had Grade 8 education; 15% graduated from high school and 11.7% had post secondary education. Five percent of the sample regularly took two prescription medications; 30% took three medications; 40% took four medications and 25% took five medications. Only 31.7% of the patients used a pill device to assist with medication routines, while 68.3% used no pill device. Forty percent of the patients in the study adhered to the prescribed routines all of the time; 46.7% of the patients adhered to the routine most of the time (80% or over adherence to routines as prescribed by the physician) and 6.7% of the patients followed the prescribed routine some of the time (less than 80% adherence to routines). These results are based on self reports at the posttest interview. Difficulty encountered with using an objective pill count eliminated this measurement of adherence.

The results as shown in Table 5 show that no significant differences were found in this distribution from the total population

using Chi Square calculation for each variable by group. There was no bias found in the sample.

Table 5

Chi Square - Each Variable by Group

Variable	X^2	df	p
Gender	1.21	2	NS
Age	34.8	38	NS
Living Arrangement	9.18	4	NS
Educational Level	4.02	6	NS
Number of Drugs Taken	6.18	6	NS
Use of Pill Device	2.0	2	NS
Adherence to Routine	4.92	4	NS

Pretest and Posttest Scores

Each of the subjects was interviewed by the nurs researcher prior to leaving the hospital but after the standard teaching for that unit was completed (pretest) and one month post discharge (posttest) to measure his/her knowledge level with regard to his/her regularly prescribed medications.

The range in scores for Treatment Group I on the pretest was 17 to 43 and posttest from 25 to 45. An overall gain of 63 points between pretest and posttest and a loss of 2 points between pretest and post-test was noted, resulting in a net gain of 61 points (Table 6).

The range of scores for Treatment Group II on the pretest was 21 to 37 and posttest from 29 to 41. A gain of 80 points between pretest and posttest and a loss of 1 point between pretest and posttest was

noted, resulting in a net gain of 79 points (Table 7).

The range of scores for the Control Group on the pretest was 24 to 42 and posttest from 29 to 40. A gain of 20 points between pretest and posttest was noted, resulting in a net gain of 5 points (Table 8).

There were no significant differences between the means of the three groups on the pretest score or the posttest score using a one way analysis of variance (Table 9 and 10). On examination of the groups it was shown using Bartlett - Box F and Cochrans C test for homogeneity of variances (Table 11 and 12) that the groups were heterogeneous (with a small sample size and unequal groups) thereby violating the rules for use of analysis of variance (and independent t-tests). Due to this finding a non parametric statistic, Chi-Square was done to demonstrate differentials between those subjects by group that scored at or above and below the median score on both the pretest and the posttest (Table 13 and 14) and a Chi Square between pretest to post-test change scores by group (Table 15). No significant differences were demonstrated but the largest contribution to the Chi Square value on the posttest was attributed to Treatment Group II.

A paired t-test to determine significant mean differences in knowledge scores from pretest to posttest was used. A significant difference between pretest and posttest scores was shown for Treatment Group I (Table 16) and for Treatment Group II (Table 17). There was no significant difference between the pretest and posttest scores for the Control Group (Table 18)

Table 6

Comparison of Pretest and Posttest Scores for Treatment Group I

Subject	Pretest Score	Posttest Score	+/-
1	36	41	+5
2	30	41	+5
3	29	36	+7
4	38	38	0
5	41	40	-1
6	31	30	-1
7	43	43	0
8	38	*	Unable to posttest
9	37	39	+2
10	41	45	+4
11	19	28	+9
12	20	*	Unable to posttest
13	35	36	+1
14	29	33	+4
15	30	32	+2
16	32	34	+2
17	33	36	+3
18	23	32	+9
19	25	25	0
20	17	29	+12

Table 7

Comparison of Pretest and Posttest Scores for Treatment Group II

Subject	Pretest Score	Posttest Score	+/-
1	35	41	+6
2	31	38	+7
3	21	30	+9
4	35	37	+2
5	34	33	-1
6	30	35	+5
7	34	35	+1
8	33	38	+5
9	31	37	+6
10	33	37	+4
11	35	38	+3
12	34	36	+2
13	23	32	+9
14	35	38	+3
15	37	41	+4
16	35	35	0
17	33	*	Unable to posttest
18	28	35	+7
19	25	29	+4
20	37	40	+3

Table 8

Comparison of Pretest and Posttest Scores for Control Group

Subject	Pretest Score	Posttest Score	+/-
1	27	30	+3
2	38	35	-3
3	40	40	0
4	33	34	+1
5	30	34	+4
6	42	39	-3
7	35	35	0
8	36	35	-1
9	35	35	0
10	37	38	+1
11	35	36	+1
12	35	31	-4
13	24	30	+6
14	32	32	0
15	32	35	+3
16	32	32	-2
17	34	32	-2
18	31	29	-2
19	36	37	+1
20	33	* Unable to posttest	

Table 9

Analysis of Variance - Pretest Scores

Source of Variance	ss	df	Mean Square	F	P
Between Groups	58.5333	2	29.2667	0.9218	0.4036
Within Groups	1089.6500	57	31.7482		
Total	1868.1853	59			

Table 10

Analysis of Variance - Posttest Scores

Source of Variance	ss	df	Mean Square	F	P
Between Groups	40.2669	2	20.1335	1.2474	0.2955
Within Groups	855.4474	53	16.1405		
Total	895.7143	55			

Table 11

Tests for Homogeniety of Variances - Pretest Scores

	Count	$\bar{X}$	S.D.	Standard Error	Minimum	Maximum
Treatment Group I	20	31.45	7.577	1.694	17.0	43.0
Treatment Group II	20	31.95	4.490	1.004	21.0	37.0
Control Group	20	33.75	4.204	.940	24.0	42.0
Totals	60	32.68	5.627	.726	17.0	43.0

Cochrans C = Max.Variances/Sum(Variances)=.6029, p= .005 (Approx)
Bartlett - Box F = 4.160, p = .016
Maximum Variance/Minimum Variance = 3.249

Table 12

Tests for Homogeniety of Variances - Posttest Scores

	Count	$\bar{X}$	S.D.	Standard Error	Minimum	Maximum
Treatment Group I	18	35.17	5.317	1.253	25.0	45.0
Treatment Group II	19	33.05	3.325	.763	29.0	41.0
Control Group	19	34.00	3.123	.718	29.0	40.0
Totals	56	35.07	4.036	.539	25.0	45.0

Cochrans C = Max.Variances/Sum(Variances)=.5767, p= .016 (Approx)
Bartlett - Box F = 3.081, p = .046
Maximum Variance/Minimum Variance = 2.891

Table 13

Chi Square - Knowledge Level (Pretest) by Group

Knowledge Level	Group		
	Treatment Group I	Treatment Group II	Control
At or Above Median Score	9	13	13
Below Median Score	11	7	7

X^2 = 2.193, df = 2, p = N.S.

Table 14

Chi Square - Knowledge Level (Posttest) by Group

Knowledge Level	Group		
	Treatment Group I	Treatment Group II	Control
At or Above Median Score	10	15	10
Below Median Score	8	4	9

X^2 = 3.35, df = 2, p = N.S.

Table 15

Chi Square - Pretest to Posttest Change Score by Group

Change Score	Group		
	Treatment Group I	Treatment Group II	Control
Gained	13	17	8
Maintained	3	1	4
Lost	2	1	7

X^2 = 10.53, df = 4, p = N.S.

Table 16

Paired t-test - Treatment Group I

	Pretest	Posttest
$\bar{X}$	31.72	35.20
S.D.	7.33	5.31

df = 17, p = .001

Table 17

Paired t-test - Treatment Group II

	Pretest	Posttest
$\bar{X}$	31.90	36.05
S.D.	4.61	3.33

df = 18, p = .000

Table 18

Paired t-test - Control Group

	Pretest	Posttest
$\bar{X}$	31.79	34.00
S.D.	4.32	3.13

df = 18, p = .716

Relational Analysis and Correlations

Using a Chi Square calculation to determine if there were differentials between each variable and gender (Table 19) the following results were shown. There was no significant differential between group and gender, age and gender, number of drugs taken and gender, use of pill device and gender and adherence to routine and gender. It was shown that a greater proportion of females tended to have post secondary education than males and that a greater proportion of females lived alone than did males. Males in the sample tended to be married and live with spouse or families.

Table 20 illustrates the Chi Square findings determining any difference between each variable and living arrangement. There was no significant difference between group and living arrangement, age and living arrangement, education level and living arrangement, use of pill device and living arrangement and adherence to routine and living arrangement. A significant difference was shown between gender and living arrangement with more females living alone and more males living with spouse or families.

The only significant finding using Chi Square calculations to determine a difference between each variable and adherence to routine was between the use of a pill device and adherence to routine. Those who used a pill device were less likely to adhere to the medication regimen as prescribed by the physician (Table 21).

Pearson product moment correlation coefficients were calculated

to determine relationships between the variables and the results of the pretest and the posttest (Table 22). A significant relationship was noted between age and both the pretest and the posttest scores; between education level and the pretest and posttest scores and between adherence to routine and both the pretest and posttest scores, and between living arrangements and posttest scores.

Differences Among Groups Broken Down By Variables

Breaking down the pretest and posttest scores by gender shows no significant findings in Figure 2. The data presented in Figure 3 shows there was no significant difference noted when the pretest and posttest scores were broken down by living arrangement.

The analysis of variance showed significant difference in the breakdown of both pretest scores and posttest scores by educational level (Figure 4). Those with high school education scored highest in the pretest followed second by those with post secondary education, then those with Grade 8 and lowest scores were noted for those with less than Grade 8 education. Those with post secondary education scored highest on the posttest, second were those with high school education, third were those with Grade 8 education and lowest, those with less than Grade 8 education.

No significant findings were noted in the breakdown of scores by number of drugs taken (Figure 5) or scores by use of pill device (Figure 6).

The variance in both the pretest scores and posttest scores by adherence to routines was significant (Figure 7). In both cases, those who stated that they adhered to the prescribed routine all of the time scored highest, those who stated that they adhered most of the time were second highest and the lowest scores were found in the group that stated that they adhered to the prescribed routine some of the time.

Table 19

Chi Square - Each Variable by Gender

Variable	X^2	df	p
Group	1.20	2	NS
Age	16.20	19	NS
Educational Level	8.52	3	.04*
Living Arrangement	15.40	2	.004*
Number of Drugs Taken	5.19	3	NS
Use of Pill Device	1.90	1	NS
Adherence to Routine	4.80	2	NS

*p≤ .05

Table 20

Chi Square - Each Variable by Living Arrangement

Variable	X^2	df	p
Group	9.18	4	.0567
Age	44.80	38	NS
Gender	15.45	2	.0004*
Educational Level	2.53	6	NS
Number of Drugs Taken	8.43	6	NS
Use of Pill Device	2.12	2	NS
Adherence to Routine	8.00	4	NS

*p≤ .05

Table 21

Chi Square - Each Variable by Adherence to Routine

Variable	X^2	df	p
Group	4.92	4	NS
Age	32.79	38	NS
Gender	4.81	2	NS
Educational Level	6.97	6	NS
Living Arrangement	8.00	1.59	NS
Number of Drugs Taken	1.59	6	NS
Use of Pill Device	6.88	2	.032*

*p≤ .05

Table 22

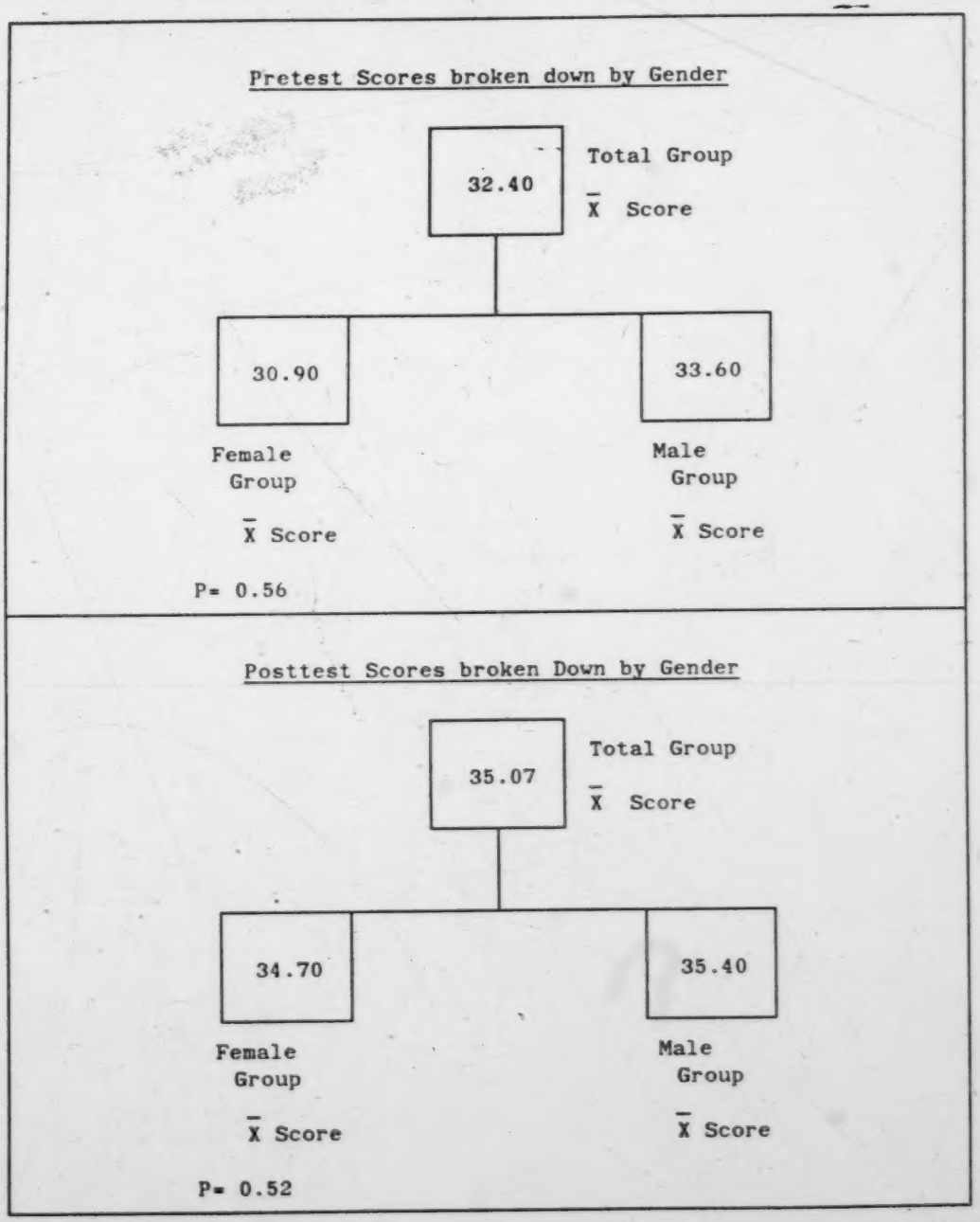
Pearson Product Moment Correlation Coefficients

Each Variable by Pretest and Posttest Scores

Variable	Pretest	Posttest
Category	r= .15 p= .13	r= -.12 p= .19
Gender	r= .21 p= .06	r= .09 p= .26
Age	r= .40 *p= .001	r= -.43 *p= .000
Education Level	r= .36 *p= .003	r= .34 *p= .005
Living Arrangement	r= .16 p= .11	r= .22 *p= .05
Number of Drugs Taken	r= .05 p= .36	r= -.11 p= .21
Use of Pill Device	r= -.16 p= .12	r= .05 p= .35
Adherence to Routine	r= -.30 *p= .012	r= -.33 *p= .006

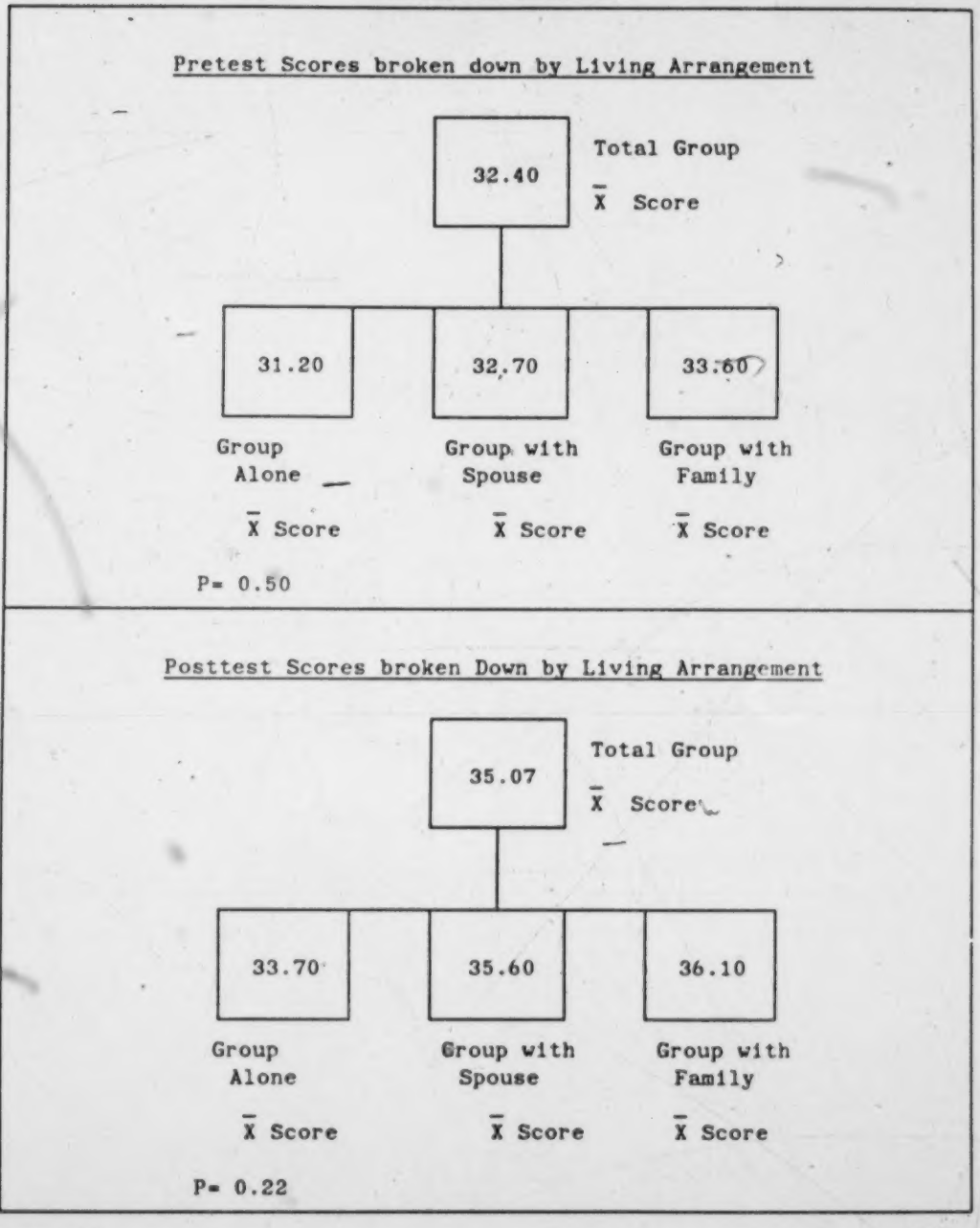
*P< .05

Figure 2: Pretest and Posttest Scores Broken Down by Gender



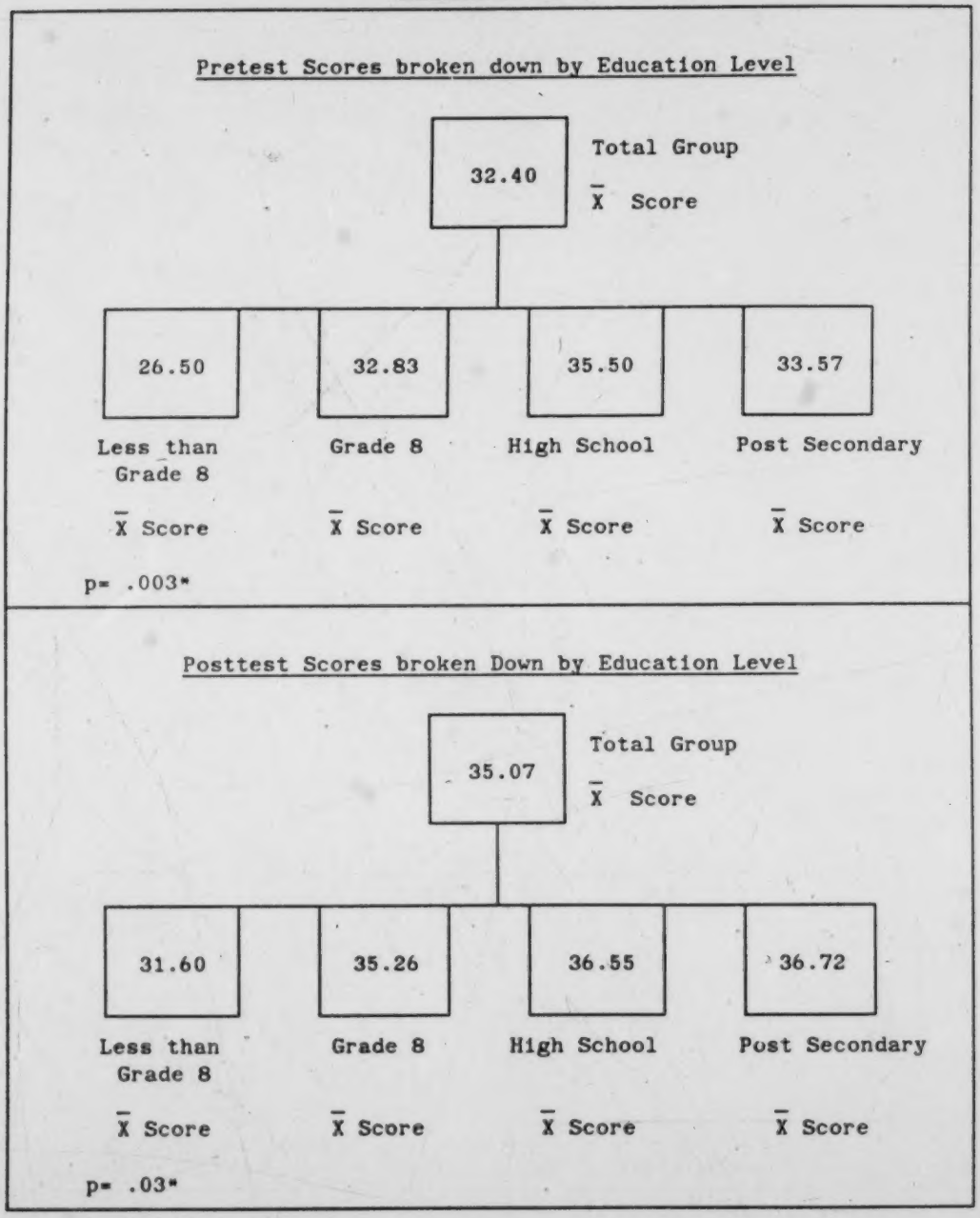
* $p \geq .05$

Figure 3: Pretest and Posttest Scores Broken Down by Living Arrangement



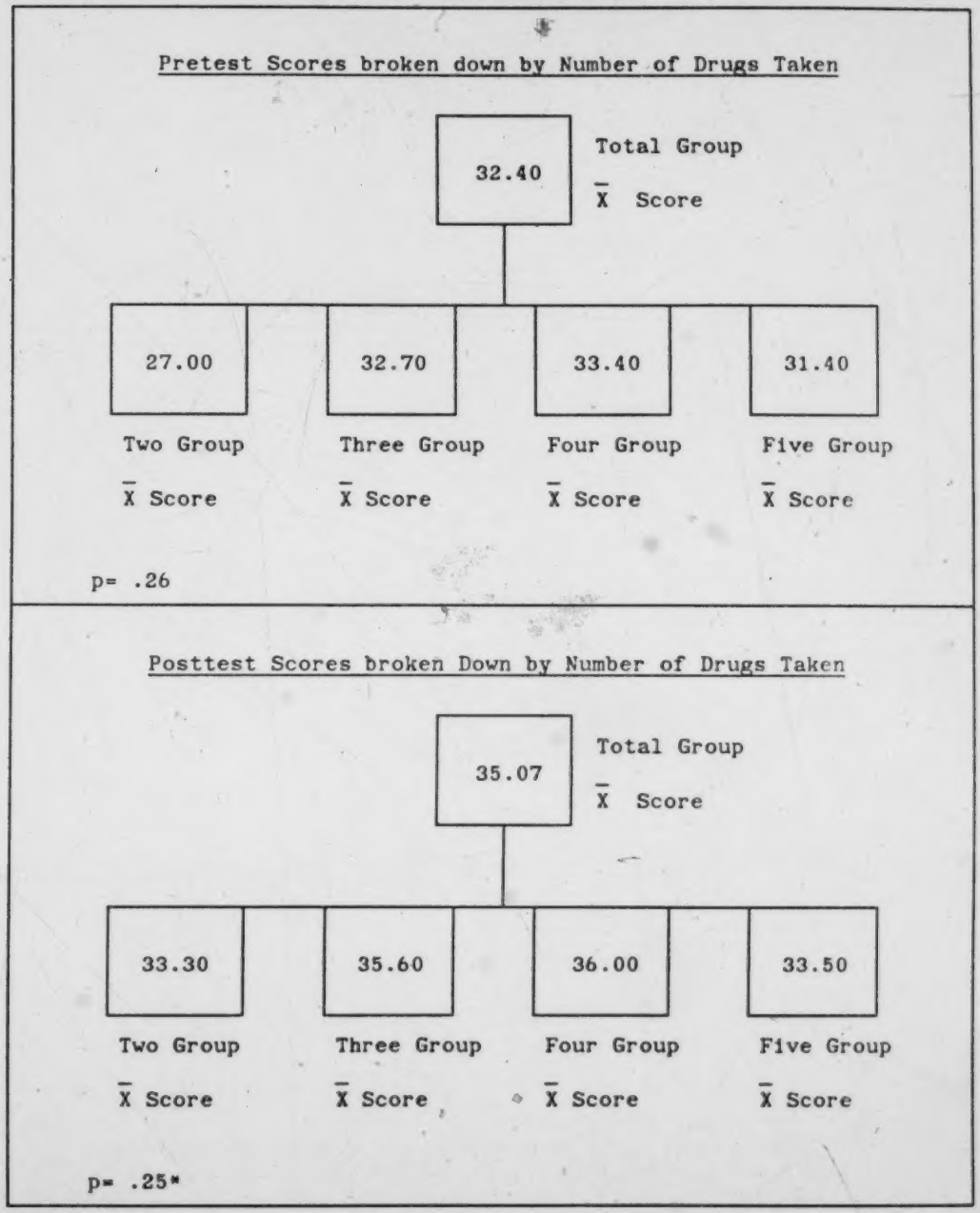
* $p \geq .05$

Figure 4: Pretest and Posttest Scores Broken Down by Education Level



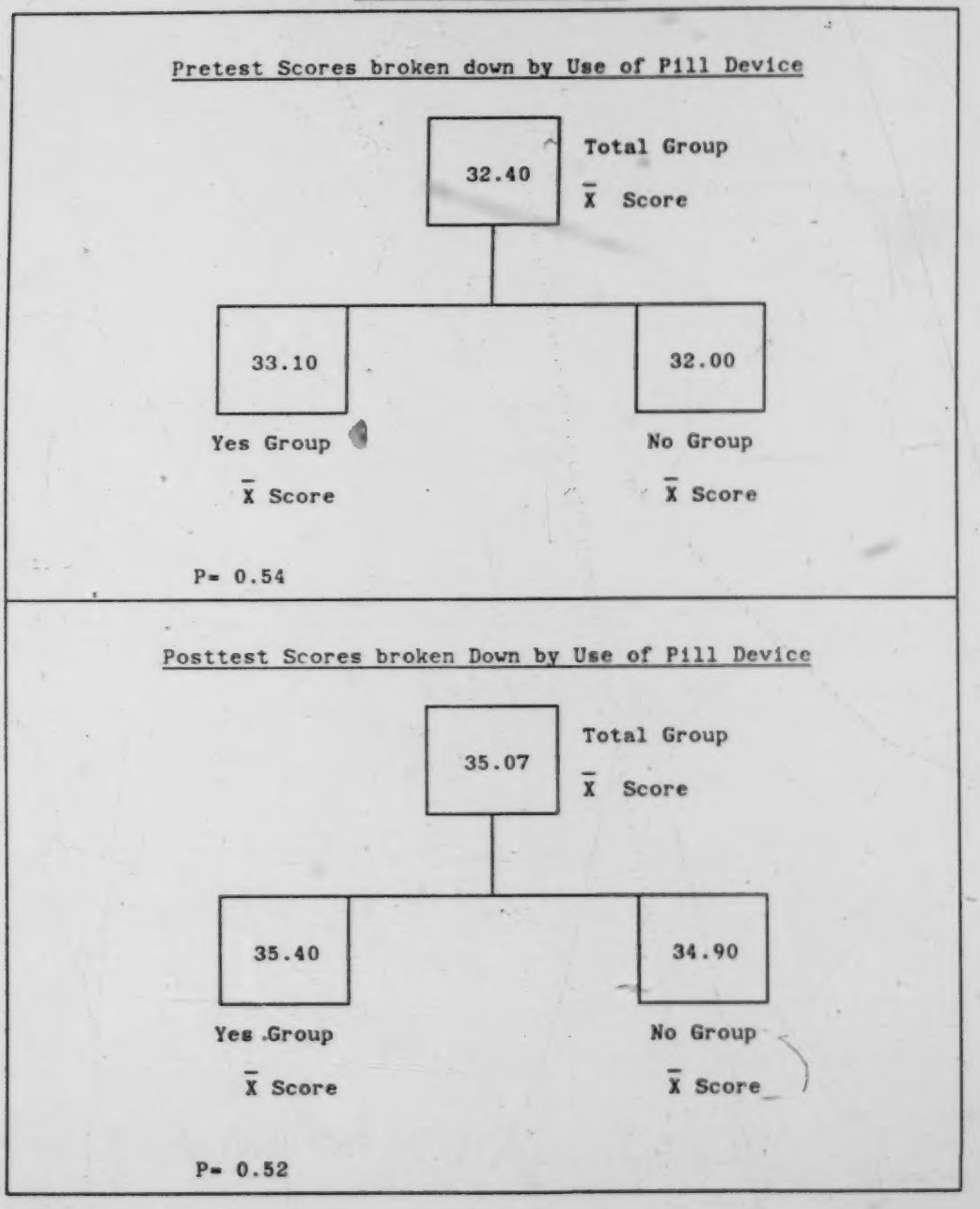
* $p \geq .05$

Figure 5: Pretest and Posttest Scores Broken Down by Number of Drugs Taken



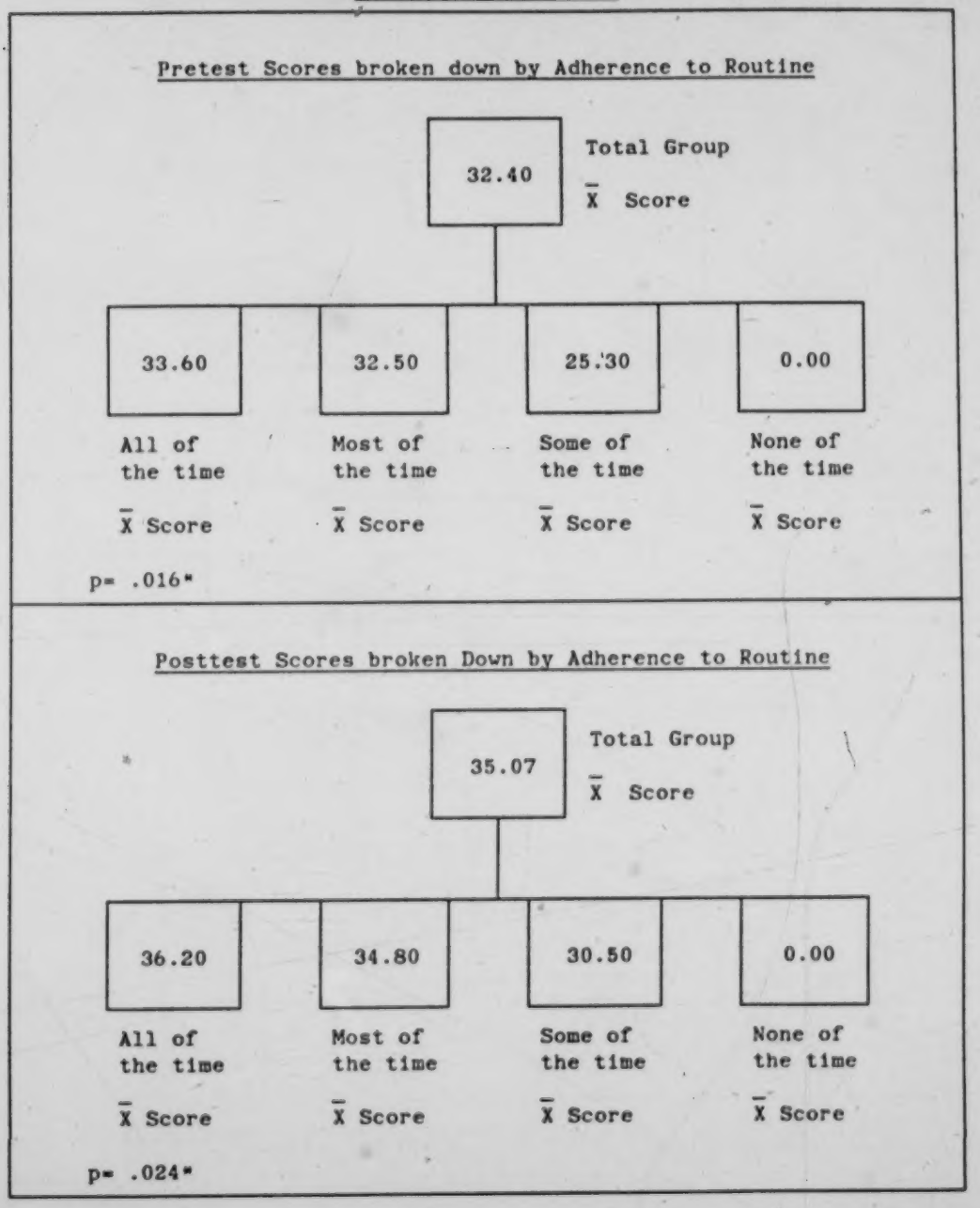
* $p \geq .05$

Figure 6: Pretest and Posttest Scores Broken Down by Use of Pill Device



* $p \geq .05$

Figure 7: Pretest and Posttest Scores Broken Down by Adherence to Routine



* $p \geq .05$

CHAPTER V

Discussion

Findings

The purpose of this study was to examine the effectiveness of instruction, reinforcement and monitoring on the self-medication routines of older adults.

Hypothesis 1. Patients who are given a program of drug instruction will show greater knowledge of drugs than those who do not have such a program of instruction.

Hypothesis 2. Patients who are given a program of drug instruction and telephone reinforcement will show greater knowledge of drugs than those who do not have telephone (instruction) reinforcement, and those who do not have a program of instruction.

The results did not statistically support the first two hypotheses, they were therefore not accepted. The group that received structured teaching only and the group that received structured teaching and reinforcement had higher mean scores than the control group but the results were not statistically significant. Because the groups were not homogeneous an analysis of variance could not be used. A Chi

Square (3x2) did not show significant differences between the groups at the .05 level. There was a directional trend, demonstrating that the treatment group that received structured teaching and reinforcement were more knowledgeable than the group that received structured teaching only and the control group.

Hypothesis 3. Adherence to self-medication regimens will be greater in those who receive a program of drug instruction than those who do not have such a program of instruction.

Hypothesis 4. Adherence to self-medication regimens will be greater in those who receive a program of drug instruction and telephone reinforcement than those who do not have telephone reinforcement, and those who do not receive a program of instruction.

The results did not statistically support these hypotheses. The treatment groups adhered to the prescribed routine (according to their self reports) more often than the control group. No significant differences were demonstrated between Treatment Group I (structured teaching only) and Treatment Group II (structured teaching and reinforcement) on either knowledge or adherence scores.

While there were no significant differences between the groups, the results of patient teaching appeared to have made a difference in knowledge levels from the pretest to the posttest in the treatment

groups but there was no significant change in the knowledge level for the control group who did not get the structured teaching or reinforcement. The gain scores for the treatment groups were higher than the control group. Eleven out of nineteen patients in the control group scored the same on the posttest as they did at the pretest level or showed reduced knowledge scores at the posttest interview.

The type of patient teaching that was done, one-to-one instruction and take-home information booklets, was appreciated by the patients who received it, according to subjective comments at the time of the posttest. More than half stated that this was either the only or the most understandable teaching that they received during their hospital stay. MacGuire (1987) found that preparation for discharge from the hospital presented an ideal opportunity to help patients understand a little more about the medications they are supposed to take, and the findings of this study supported that. MacGuire's study reports as well that some patients admitted not taking pills because they did not know what they were for, and this finding mirrored the experiences of some of the patients in this study who admitted that they had not adhered to routines prescribed in the past because they did not see the need for some of their pills.

The demographics of the sample were of note in the area of age, living arrangements and education level. Because the population in this study was all over 55 years (selection criteria) the finding that 73.3% had less than a high school graduation diploma is probably con-

sistent with the education level of the general population in that generation. (Although Canadian census data is not specifically collected for the over 55 age bracket, the 1981 census information for the over 35 population shows that the highest level of education attained is proportionately lower than for the population under 35 years). While 30% of the sample lived alone and 70% lived with spouses or families, it was shown that more females lived alone than males and males, in this age group, tended to live with spouses or families. In light of male and female expectancy figures, these findings are consistent with that which would be found in the general population (Statistics Canada, 1981 Census).

A significant relationship was noted between age and pretest and posttest scores, education level and pretest and posttest and living arrangement on pretest and posttest scores. These three variables may be interrelated, with those in the higher age bracket being less educated and living alone, thereby partially explaining their lower scores on knowledge of their prescribed medications and adherence to the prescribed routines. This relationship needs further investigation.

The relationship between the use of a pill device and lower adherence to the prescribed routine also bears further study. Because 70% of the patients in this study did not use a pill device and because many who did use one had assistance with self-medicating from a significant other, these findings are not reliable and should be viewed as suspect.

The knowledge scores derived from the Horn and Swain (1977) questionnaires were reflective of total knowledge about two prescribed medications and were not broken down into subscores for specific areas of knowledge such as medication action and dosage, side effects and what to do if a dose is missed. Ascione et al. (1986) found that researchers who used summary scores made up of several knowledge measures may have oversimplified the true state of affairs. They found that patients scored higher on knowledge of drug regimen and purpose, fewer were correct about appropriate action if a dosage were missed and only a small number could identify common side effects associated with drug therapy. Interestingly though, they noted that physicians, pharmacists and nurses often either downplay or omit reference to missed doses or any unwanted effects when providing patient education. Although the summary scores in this study may be a limitation in determining where the knowledge gaps exist, the inconsistency in teaching and omission of information was not a fault in this study, as all patients in the treatment groups received the same instruction and booklets. In a further study, using consistent information for all patients, it would be important to examine subscores for knowledge measures.

To get an accurate pill count for many patients at the posttest interview was impossible so subjective data was used to report adherence to the prescribed routine. Because some prescriptions were unchanged from the subject's prehospital routine except for dosage, patients continued to use the pills they had after they returned home,

refilling the prescription before the posttest. Some stored back-up pill supplies in the spouse's purse, in the glove compartment of the car or in a locker at work, making the count in the bottle at home inaccurate. One shared the same prescription medication with a spouse, also sharing the same pill bottle so pill counting could not be undertaken. In future studies more controls would be necessary to objectively measure adherence to medication routines. Blood and urine tests to determine levels and indirectly determine the amount of drug taken could be used, (but accuracy of such tests has been questioned). Dispensing of all prescriptions for one month's time from the hospital pharmacy, instructing patients to use only these medications and asking patients to keep their medications in one place to allow accurate pill counting would be another way to measure adherence. In addition, asking patients to keep a medication record or check list for each drug would allow more accurate measurement of adherence.

In the groups of patients under 65 years of age and without an insurance plan to pay for the drugs, the cost of the medications may have been a factor in non-adherence to the routine even though their knowledge of medications was accurate when tested. Motivation was not measured per se in this study because the deficit was assumed to be knowledge, and for most patients this was the case.

In less than 15% of the sample motivation to take the medications as prescribed appeared to be low, even though measured knowledge and skill appeared adequate. Missing dosages of diuretics for convenience

was a common alteration from the routine. Two patients, even though they knew when and why they should take their medications, reduced the dosage by half because they felt that too many pills were not good for them and one, with full knowledge of the prescribed dose, under the guise of economy reduced the dosage.

The trend in the direction of an increase in the posttest scores for the treatment groups indicated that the instruction sessions and the booklets may have made a difference. Patients discussed at the posttest interview how they had reviewed the booklets on several occasions during the month from pretest to posttest, and had shared the information with spouses and family members. In several instances, patients in the treatment groups were prompted to seek clarification from the pharmacist, or physician or a family member in the health professions about one of the drugs included in the teaching or one of their other drugs. It was interesting to note that some patients in the control group indicated that they wished that they had had their booklets when they were discharged from the hospital and that the booklets reminded them of some of the information that they had been told while hospitalized but had forgotten until reading it in the teaching booklet.

The value of the telephone reinforcement at two weeks post discharge could be questioned. Even though patients had appointments arranged prior to discharge some required several calls to find them at home and most had to take time to locate their booklets and did not

have them near the phone at the prearranged time. The review by telephone generated few questions or clarifications but patients appeared appreciative of the call nevertheless. Because only one telephone follow-up was done with the treatment group, little rapport could be established that would be conducive to asking questions and expressing concerns. This could be viewed as a limiting factor in the study.

Some physicians purposefully limit the number of medications that patients are to take at home because they know that certain patients have been non-compliant in the past or they had made comments that they may not be compliant post discharge. Murray et al. (1986) reported that when some drugs are of questionable value, in order to enhance compliance for essential medications, and to eliminate frustration with the treatment to optimize the therapeutic response, some physicians keep prescribed medications to a minimum. Perhaps this could be an explanation for the tendency for patients only taking two medications to score lower on both pretest and posttest scores, because they fall into the category where their physicians question their previous knowledge of/or adherence to the routine. This finding was opposite to that of the many studies that report that the more complex the routine, the lower the knowledge and the compliance (Parkin, 1976; Malahy, 1966; Murray (1986).

Implications for Nursing

The findings of this study have implications for nurses in the hospital and nurses in the community. The need for structured patient teaching and information in a printed form to send home with the patient has been demonstrated as well as the need for some follow-up of a group that appear to be "at risk" - the older patient who lives alone, has less than a high school education and takes more than four regularly prescribed medications. As Gibb (1985) stated: 'health professionals can no longer assume that people are passive recipients of health care'; and how can we expect a patient to administer medicine safely without information? The need to provide information and follow-up is germaine to the success of maintaining patients outside of institutions and in their own homes. Gibb (1986) found that communication links between hospital nurses and community nurses or health visitors alerted them to any problems with medication administration experienced in the hospital, and that contact with the chemist regarding labelling, packaging or instructions, although not often necessary, could be easily achieved. Murray et al. (1986) found that once a medication routine is initiated inaccurately, the patient who lives alone may not have the error corrected until a future visit to the physician or at prescription refill. Based on this information, it would seem reasonable that every health professional who has contact with these patients i.e. visiting nurse, pharmacist, physician, should

review the drug routine with them to determine if there are any misunderstandings.

The information booklets were found to be of interest and assistance to both patients and their families. To maximize the effectiveness of this type of teaching the nurse needs to spend some time explaining the details about the medication and the routine in a quiet environment and allow the patient an opportunity to ask questions.

Many patients at the posttest interview indicated that the day they were discharged from the hospital was a hectic one. They reported being rushed, concerned about how they would cope at home, anxious that medical conditions would worsen and they would be readmitted and even apprehensive about family members driving in winter conditions to pick them up. The 'teachable moment' for most of the patients was not on the day of discharge from the hospital and it is suggested that such teaching should begin the day the medication is prescribed. Reinforcement of this teaching could be done each time the nurse brings the medication to the bedside. Also the timing of the medications while patients are hospitalized should be as close to the routine that they will follow at home, as possible. Approximately thirty percent of the patients at posttest interview commented that the hospital routine of dispensing medications was confusing. For example, a patient would take a fluid pill in the early morning at home yet in the hospital these pills are not brought to them until mid morning, or medications that they know should be taken before meals arrive simultaneously with

the meal tray. These experiences described by patients indicated that more care needs to be taken while patients are hospitalized to role model the way medications should be taken, as well as teach patients about their medicines and routines and provide information in a written, easy to comprehend form for them to read when they get home.

Limitations of the Study

Because the sample size was only 60 patients, only a medium effect of the treatment could be determined. Perhaps with a larger sample, indicators that showed a directional trend might be found to be significant.

Due to lack of homogeneity of the groups and small sample size, parametric statistics could not be used for the pretest and posttest scores. A less robust nonparametric statistic, Chi Square was used, but the variance between groups could not be examined.

Due to the many reasons why an objective measure (pill count) could not be used to determine adherence, self-reports of adherence to medication routines were used. This is recognized as a limitation and in future studies more controls over prescription refill dates, back-up supplies and prescription sharing would need to be put in place.

The Hawthorne effect in both of the treatment groups must be acknowledged. Patients were appreciative of the teaching, the booklets and the phone calls and could have shown their appreciation through agreement to participate in the study, greater attention to their

medication routines, and the review of the booklets prior to posttesting to enhance their knowledge.

It was recognized that several of the variables measured, such as age and living arrangement may have been interrelated so no definitive profile of a patient either 'at risk' or 'most likely to adhere knowledgeably to the routine' could be determined.

Recommendations for Further Study

Further study could be done to explore the relationship between the use of a pill device and adherence to the prescribed medication routine. The results from this study are inconclusive because only 30% used a device and the errors in the group not using a device could have been due to other variables such as number of pills taken, presence of a significant other in the household or even where the pill device was located once it was filled. More accurate measures to determine adherence to the routine might also be employed in further studies.

Subscores of knowledge measures should be examined in a study where the teaching and information is consistent, to determine where the gaps in knowledge about medication routines occur.

The relationship between age and living arrangement and education and the effects these variables have on knowledge scores related to prescribed medications and adherence to medication routines could be explored in more detail in a future study.

There is a trend towards a difference between the groups receiv-

ing structured teaching and reinforcement when compared with the control group. Therefore it is recommended that the study should be replicated using a larger sample to allow an analysis variance to be performed on homogeneous groups to determine if there are significant differences when structured teaching and reinforcement are used.

Conclusions

1. Patients who received structured teaching and structured teaching with telephone reinforcement did not score higher than the control group on knowledge about two of their prescribed medications. There was a directional trend toward increased scores for the treatment groups and a larger sample may have resulted in significant differences.
2. Patients who scored higher on the knowledge measures were more likely, by self-report to adhere to their prescribed medication routine than those with lower scores.
3. Patients who lived alone, had less than a high school education and took more than four medications regularly were likely to score lower on knowledge measures about their medications and show lower adherence to their medication routine than patients who were younger, high school educated and took less than four medications regularly.
4. Patients who used a pill device were less likely to adhere to their prescribed medication routine. Caution is advised in ac-

cepting this conclusion without further investigation.

5. Patients and their families appreciated and benefitted from structured teaching and take-home instruction booklets about their medications.

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APPENDIX A

INFORMED CONSENT FORM

THE UNIVERSITY OF ALBERTA

FACULTY OF NURSING

INFORMED CONSENT FORM

Project Title: The effectiveness of Instruction, Reinforcement & Monitoring on Self-Medication Routines with Older Adult Patients.

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The purpose of this research project is to study the effectiveness of instruction, reinforcement and monitoring on knowledge of prescribed drugs and adherence to self-medication routines in older adult patients, discharged from the hospital. You will be randomly assigned to one of three groups. All participants will complete one interview related to the medications that the doctor has prescribed prior to discharge from hospital and one in their own home one month after discharge from hospital. All participants will receive printed information sheets about two of their drugs - two groups will receive these prior to discharge from hospital and one group will receive them one month after discharge. One group will receive a telephone call from the nurse researcher about two weeks after discharge from hospital. You will need to have your medications available during the interviews in your home for the nurse to check.

The main benefit to you for participating in this study will be the knowledge provided about your medications. However, there will also be indirect benefits to both yourself and other older adult patients, in the research findings.

This is to certify that I _____
Print name
hereby agree to participate as a volunteer in the above named project.

I understand that there will be no health risks to me resulting from my participation in the research.

I hereby give my permission to be interviewed and for written records to be kept of these interviews until the study is completed. I give permission for the nurse researcher to examine my medications upon her request. I understand that findings from the study may be published, or shared with other health professionals, but my name will not be associated with the research and I will not be able to be identified in any way.

I understand that I may decline to answer any question during the interviews and I am free to withdraw my consent and terminate my participation in this study at any time. Withdrawal from this study will not influence my medical or nursing care in any way.

I understand that I will not incur any costs related to this study. Interviews and telephone calls will occur during a time and date that is mutually agreed upon by myself and the nurse researcher.

I have been given the opportunity to ask whatever questions I desire, and all such questions have been answered to my satisfaction.

_____
Signature

_____
Date

_____
Witness

APPENDIX B

CRITERIA FOR SUBJECT SELECTION

Criteria for Subject Selection

1. Fifty-five years of age or older
2. Have a discharge to home date set by the health team
3. Be oriented to time/place/person
4. Have no more than five prescribed drugs to continue to take on a regular basis
5. Have at least two drugs ordered from the categories of
   - Diuretics
   - Oral Hypoglycemics
   - Digitalis Medicines
   - Antianginal/Vasodilators
   - Beta Adrenergic Blocking Agents
   - Anticoagulants
6. Have no profound sensory deficits deemed by the health team to interfere with ability to receive instruction or to self-medicate eg. blind, deaf
7. Have no profound motor deficits deemed by the health team to interfere with ability to self-medicate
8. Have no swallowing difficulties
9. Speak and read English
10. Have a telephone in the home.

APPENDIX C

PRETEST QUESTIONNAIRE

PRETEST QUESTIONNAIRE - MEDICATION KNOWLEDGE

1. "What are the names of the medications you will be taking after discharge?"

   Patient response: _____

   _____

   _____

   _____

   1. Correct
   2. Mixed (correct and incorrect)
   3. Doesn't know, irrelevant
   4. Incorrect

   Insert names of medications for which this series of questions applies.

   _____ _____

   "Now I am going to ask you some specific questions about two of your drugs, and I will start with.

   _____

2. "How long have you been on this drug?
   Patient response:"

   1. Correct
   3. Doesn't know, irrelevant
   4. Incorrect

3. "What condition do you have that makes this medicine necessary?"
   Patient response:

   1. Correct
   2. Mixed (correct & incorrect)
   3. Doesn't know, irrelevant
   4. Incorrect

4. "What is this medicine supposed to do for you?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

5. "What would happen if you did not take this medicine:?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

6. "How much of this medicine are you supposed to take:?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

7. "At what times will you take it?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

8. "Are there any situations where, on your own you should change the amount and time that you take this medicine?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

9. "Tell me about them" (If answer to #8 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

10. "Are there any situations when you should not take this medicine?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

11. "Tell me about them." (If answer to #10 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

12. "Are there any special instructions about food and fluids because you are taking this medicine:"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

13. "What are they?" (If answer to #12 was yes:)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

14. "Are there activities you should avoid while taking this medicine?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

15. "What are they?" (If answer to #14 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

16. "Are there other medicines that you should avoid while taking this medicine?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

17. "What are they?" (If answer to #16 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

18. "Are there any side effects this medicine might have?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

19. "What are they?" (If answer to #18 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

20. "Are there things that you can do to cope with or decrease these side effects?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

21. "What are they?" (If answer to #20 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

22. "For which of these side effects would you contact your doctor or nurse?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

23. "How will you fit taking this medication into your daily routine?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

24. "Are there things that would make you take or not want to take this medication?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

25. "What ways have you thought of to take care of (cope with) that?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

"Now I am going to ask you some questions about one other drug that your doctor has prescribed for you. These questions are about_____.

26. "How long have you been on this drug?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

27. "What condition do you have that makes this medicine necessary?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

28. "What is this medicine supposed to do for you?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

29. "What would happen if you did not take this medicine:?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

30. "How much of this medicine are you supposed to take:?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

31. "At what times will you take it?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

32. "Are there any situations where, on your own you should change the amount and time that you take this medicine:"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

33. "Tell me about them" (If answer to #32 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

34. "Are there any situations when you should not take this medicine?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

35. "Tell me about them." (If answer to #34 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

36. "Are there any special instructions about food and fluids because you are taking this medicine:?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

37. "What are they?" (If answer to #36 was yes:.
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

38. "Are there activities you should avoid while taking this medicine?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

39. "What are they?" (If answer to #38 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

40. "Are there other medicines that you should avoid while taking this medicine?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

41. "What are they?" (If answer to #40 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

42. "Are there any side effects this medicine might have?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

43. "What are they?" (If answer to #42 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

44. "Are there things that you can do to cope with or decrease these side effects?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

45. "What are they?" (If answer to #44 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

46. "For which of these side effects would you contact your doctor or nurse?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

47. "How will you fit taking this medication into your daily routine?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

48. "Are there things that would make you take or not want to take this medication?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

49. "What ways have you thought of to take care of (cope with) that?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

APPENDIX D

POSTTEST QUESTIONNAIRE

POSTTEST QUESTIONNAIRE - MEDICATION KNOWLEDGE

1. "What are the names of the medications that your doctor prescribed for you when you were discharged from the hospital?"

Patient response: _____

_____

_____

_____

1. Correct
2. Mixed (correct and incorrect)
3. Doesn't know, irrelevant
4. Incorrect

2. "How long have you been on this drug?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

3. "What condition do you have that makes this medicine necessary?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

4. "What is this medicine supposed to do for you?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

5. "What would happen if you did not take this medicine:?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

6. "How much of this medicine are you supposed to take:?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

7. "At what times do you take it?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

8. "Are there any situations where, on your own you should change the amount and time that you take this medicine:?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

9. "Tell me about them" (If answer to #8 was yes.)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

10. "Are there any situations when you should not take this medicine?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

11. "Tell me about them." (If answer to #10 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

12. "Are there any special instructions about food and fluids because you are taking this medicine:?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

13. "What are they?" (If answer to #12 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

14. "Are there activities you should avoid while taking this medicine?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

15. "What are they?" (If answer to #14 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

16. "Are there other medicines that you should avoid while taking this medicine?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

17. "What are they?" (If answer to #16 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

18. "Are there any side effects this medicine might have?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

19. "What are they?" (If answer to #18 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

20. "Are there things that you can do to cope with or decrease these side effects?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

21. "What are they?" (If answer to #20 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

22. "For which of these side effects would you contact your doctor or nurse?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

23. "How have you fit taking this medication into your daily routine?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

24. "Are there things that would make you take or not want to take this medication?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

25. "What ways have you thought of to take care of (cope with) that?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

"Now I am going to ask you some questions about one other drug that your doctor has prescribed for you. These questions are about _____."

26. "How long have you been on this drug?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

27. "What condition do you have that makes this medicine necessary?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

28. "What is this medicine supposed to do for you?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

29. "What would happen if you did not take this medicine:"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

30. "How much of this medicine are you supposed to take:?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

31. "At what times will you take it:?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

32. "Are there any situations where, on your own you should change the amount and time that you take this medicine:"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

33. "Tell me about them" (If answer to #32 was yes.)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

34. "Are there any situations when you should not take this medicine?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

35. "Tell me about them." (If answer to #34 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

36. "Are there any special instructions about food and fluids because you are taking this medicine:"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

37. "What are they?" (If answer to #36 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

38. "Are there activities you should avoid while taking this medicine?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

39. "What are they?" (If answer to #38 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

40. "Are there other medicines that you should avoid while taking this medicine?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

41. "What are they?" (If answer to #40 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

42. "Are there any side effects this medicine might have?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

43. "What are they?" (If answer to #42 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

44. "Are there things that you can do to cope with or decrease these side effects?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

45. "What are they?" (If answer to #44 was yes)
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

46. "For which of these side effects would you contact your doctor or nurse?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

47. "How will you fit taking this medication into your daily routine?"
Patient response:

1. Correct
2. Mixed (correct & incorrect)
3. Doesn't know, irrelevant
4. Incorrect

48. "Are there things that would make you take or not want to take this medication?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

49. "What ways have you thought of to take care of (cope with) that?"
Patient response:

1. Correct
3. Doesn't know, irrelevant
4. Incorrect

APPENDIX E

CRITERIA FOR CORRECT RESPONSES

CRITERIA FOR CORRECT RESPONSES

1	Correct Response	-	Drug names exactly as doctor's order sheet. May use generic or trade name but not descriptive name such as "heart pill".
	Mixed Response	-	Must have at least one drug name correct or use descriptive name such as "heart pill".
2	Correct Response	-	See doctor's order sheet for start date; correct response need not be exact day but answer such as "during this hospital stay", "when I was hospitalized in November;" "last March when I had my annual physical." If statement such as "for years" is made, try probing for more specifics and if none forthcoming, circle "doesn't know."
3	Correct Response	-	See admission sheet for diagnosis. Correct response needs to be more specific than "to make me feel better;" i.e. Anticoagulants - "because my blood clots too quickly and forms blood clots that could plug my blood vessels;" i.e. Diuretics - "because I keep too much fluid in my blood and I get puffy or my lungs get congested with fluid etc."
4	Correct Response	-	eg. Anticoagulants - slow down the speed at which my blood clots
		-	eg. Diuretics - draw fluid out of my tissues and put it out of my body through my kidneys as urine
		-	eg. Nitrates - dilate my blood vessels so more blood can get to my heart.

5	Correct Response	-	The responses would be the converse of #4.
6	Correct Response	-	Exact dosage as per doctor's order sheet. If response is"one pill, probe for details and if not forthcoming circle 'doesn't know'!
7	Correct Response	-	Exact times, as per doctor's order sheet. If response is"four times a day" but not specific times this is not correct. If response is in relation to meal times and bedtime, this is correct.
8 & 9	Correct Response	-	Answer is specific to drug eg. if pulse rate below personal lowest level, digitalis medicines and beta adrenergic blocking agents not taken. Times for diuretics may change with personal schedule.
10 & 11	Correct Response	-	Answer is specific to drug eg. if any signs of bleeding, stop anticoagulants eg. if nauseated and vomiting don't take oral hypoglycemics.
12 & 13	Correct Response	-	When contra-indications exist or special conditions, most prominent one needs to be named to be correct. Less important details minus the most important constitute a mixed response.
14 & 15	Correct Response	-	as in 12 & 13.
16 & 17	Correct Response	-	must mention "across the counter medication restriction and any other prominent one i.e. aspirin with anticoagulants to be correct.
18	Correct Response	-	must be yes.
19	Correct Response	-	must be able to name at least 50% of those listed in booklet.
20 & 21	Correct Response	-	if yes to 18 & 19 must be able to think of one coping strategy to get a correct response score.

22	Correct Response	-	any side effects that persist should be reported as well as prominent ones i.e. diuretics - leg cramps; anticoagulants -bleeding; digitalis medicines - slow weak pulse.
23	Correct Response	-	at least one suggestion.
24 & 25	Correct Response	-	varies with drug and patient. - Each response needs to be assessed on own merit.

APPENDIX F

GUIDELINES FOR USE OF KNOWLEDGE SCALES

GUIDELINES FOR USE OF KNOWLEDGE SCALES

(4 item scale)

OBSERVER JUDGEMENT

1. Correct
2. Mixed (both correct and incorrect)
3. Don't know or irrelevant
4. Incorrect

The scales are arranged in order to evaluate the presence of knowledge that would be helpful for successfully managing at home, or of knowledge that would be harmful. Knowledge about health problems that is correct and complete is most helpful. A mixture of correct and incorrect knowledge, lack of knowledge, or irrelevant knowledge is placed midway between as to being helpful or harmful to successful management of health problems after discharge. Incorrect knowledge is judged to be most harmful.

In using the questionnaire where these scales appear, the observer/interviewer should record the patient's response as given for each question of the appropriate series. After the interview, the interviewer should then review the responses and circle the scale number below the response that best describes the response. This judgment should be guided by the examples of correct responses in the manual and by face-sheet information. When several responses are being scored on one scale, the group of responses should be evaluated as a whole.

DEFINITIONS

Correct -- The patient's responses are on the list of correct responses in the observer manual or the observer judges that the patient's statements are accurate and show knowledge that will be helpful in managing the problem at home. The patient's responses are still considered correct if irrelevant statements are made in addition to correct responses. To be correct, the patient's response must include all the responses on the correct response lists for that question. The patient's response is considered correct if it is accurate and helpful in managing self-care.

Mixed -- The patient gives both correct and incorrect information in his response to the question.

Doesn't know -- The patient makes a statement such as "I don't know", "The nurse told me but I can't remember", or "I can't think of anything.

Irrelevant -- The response does not address the question or the response describes an action that differs from recommended therapy and may be ineffective, but is harmless and does not interfere with therapy, e.g., "Just hope for the best". (When irrelevant statements are made, the observer should probe to obtain a relevant response if the patient can give one.)

Incorrect -- The patient's responses are not on the list of correct responses and the observer judges them to be incorrect i.e., to show misinformation that would either harm the patient or interfere with therapy. The patient's responses are still considered incorrect if irrelevant statements are made in addition to the incorrect responses.

Evaluating Patient Responses

The chart below summarizes the guidelines for evaluating the patient's responses on the 4 item knowledge scales.

Point on Scale	Defining Characteristics	May Also Include	Must Not Include
Correct	1) At least one correct statement is made. 2) All items from correct response lists are included.	Irrelevant statements	Incorrect statements
Mixed	1) At least one correct statement is made and one or more items from correct response list 2) At least one correct and incorrect statement is made	Irrelevant statements	

(Continued)

Point on Scale	Defining Characteristics	May Also Include	Must Not Include
Irrelevant	1) The patient makes a statement such as "I don't know" 2) No relevant response (correct or incorrect) can be obtained by probing.		Correct statements. Incorrect statements. (If correct or incorrect statements are made, they are used to evaluate the response instead of the irrelevant or "don't know" statements.)
Incorrect	At least one incorrect statement is made.	Irrelevant statements	Correct statements

APPENDIX G

DEMOGRAPHIC DATA

DEMOGRAPHIC DATA

Patient's Initails _____ Sex: M ___ F ___

Age: _____

Highest Education Level Reached: Less than Grade 8 _____

Grade 8 _____

High School Graduation _____

Post Secondary Graduation _____

Living Arrangement: Alone _____

With Spouse _____

With Family _____

Number of Prescribed Medications to be taken regularly: Two _____

Three _____

Four _____

Five _____

Do you use a helping device for pill taking? Yes ___ No___

Did you receive instruction about your drugs from any other source? Yes ___ No___

Have you taken your pills as the

Dr. Ordered? Yes ___ No___

Most of the time _____ Some of the time _____

APPENDIX H

BETA ADRENERGIC BLOCKING AGENTS

BETA ADRENERGIC BLOCKING AGENTS

The drug prescribed for you from this 'family' of drugs is _____

You may also hear this drug referred to as a "high blood pressure pill", or a "beta blocker" or "heart pill".

NAME OF DRUG?:

HOW MUCH TO TAKE?:

HOW IT WORKS?:

1. Causes there to be less tension on the blood vessels throughout your body so that blood can flow through more easily and under less pressure.

2. Acts to decrease tension and protect your heart muscle.

WHEN TO TAKE?:

1. Your doctor wants you to take this medication at _____

2. Take with meals or immediately following meals.

3. Periodically count your pulse rate at your wrist.

ANY FOOD OR FLUID CONSIDERATIONS?:

Although there are no considerations just because you take this drug, your doctor may have advised you about a special diet to follow because of your blood pressure. This medicine is most effective if the diet is also followed carefully.

ANY ACTIVITY CONSIDERATIONS?:

1. You should check with your doctor about what a safe level of exercise is for you. This will depend on the level of your blood pressure.

2. Some people become dizzy or lightheaded when taking this drug so you should know how it affects you before you drive, use machinery or do jobs that require you to be alert.

3. Because you are more sensitive to cold due to blood circulation to your skin being decreased by this medication, outdoor activities in very cold weather require warm clothing.

WHAT ABOUT TAKING OTHER MEDICATIONS?:

1. Do not take any other medications unless approved by your doctor. This includes medications prescribed by other doctors than Dr. _____

2. Do not take drugs or medicines that you buy at the drug store without a prescription (like cough medicine, laxatives, diarrhea medicines, antacids, etc.), unless your doctor has approved. Some could be dangerous in combination with this drug.

WHAT IF A DOSE IS MISSED?:

1. Take as soon as possible. Do not take missed dose if next scheduled pill time is within 4 hours.

2. Never double the dosage.

ARE THERE ANY SIDE EFFECTS?:

1. Dizziness/lightheadedness
2. Dry mouth, eyes, throat
3. Unusually slow pulse.
4. Reduced alertness
5. Sensitivity to cold.
6. *May cause signs of low blood sugar in diabetic patients.

WHAT SHOULD YOU DO IF YOU HAVE SIDE EFFECTS?:

1. Report side effects that persist more than a few days to your Doctor.
2. Surgarless gum can be used for dry mouth and throat and artificial tears for dry eyes, if this becomes bothersome.

HOW LONG SHOULD YOU TAKE THIS DRUG?:

1. Take this drug until your doctor advises you to stop taking it.

2. Do not stop taking drug without checking with your doctor because some conditions get worse if the drug is stopped suddenly.

APPENDIX I

DIURETICS

DIURETICS

The drug prescribed for you from this 'family' of drugs is _____

You may also hear this drug referred to as a "fluid pill" or "water pill".

NAME OF DRUG?

HOW MUCH TO TAKE?:

HOW IT WORKS?:

1. Acts on the Kidney to reduce the amount of water in the body by increasing the urine flow.

2. By reducing amount of water in body, blood pressure is reduced.

3. Causes the body to lose salt and potassium - both ingredients in the body that affect water levels.

WHEN TO TAKE?:

1. Your doctor wants you to take one pill at _____

2. Take this medication before breakfast, others have found that most convenient, so that frequent trips to the bathroom happen early in the day. If you take this medication later in the day, your sleep maybe interrupted by trips to the bathroom.

ANY FOOD OR FLUID CONSIDERATIONS?:

Because this medication causes your body to lose Potassium (an ingredient needed to keep sufficient water in cells) you should supplement this by eating foods high in potassium, such as:

- Bananas
- Orange Juice
- Apricots
- Dates

ANY ACTIVITY CONSIDERATIONS?

1. You may feel dizzy or light headed if you get up from a sitting or lying position too quickly. This is because your blood pressure is lower when you are not standing up and takes time to adjust. Get up slowly!

2. Do not stand for too long; exercise too strenuously to the point of sweating or stay outside in sunlight if the weather is hot. Additional salt is lost in sweat, and this drug had already caused you to lose salt.

WHAT ABOUT TAKING OTHER MEDICATIONS?:

1. Do not take any other medications unless approved by your doctor. This includes medications prescribed by other doctors than Dr. _____

2. Do not take drugs that you buy at the drug store without prescription (such as laxatives, cough medicine, antacids) unless your doctor has approved. Some could be dangerous in combination with this drug.

WHAT IF A DOSE IS MISSED?:

1. Take as soon as possible after you realize that you missed this pill.
2. If it is almost time for your next pill, do not take the missed pill - just wait for the next pill time.
3. Never double the dosage.

ARE THERE ANY SIDE EFFECTS?:

1. Dry mouth
2. Increased thirst
3. Muscle cramps or muscle pain.
4. Irregular heartbeats
5. Weak pulse
6. Unusual tiredness or weakness
7. Nausea and vomiting.

WHAT WOULD YOU DO IF YOU HAD SIDE EFFECTS?:

1. Report side effects that persist more than a few days to your doctor.

2. Report severe or continuing vomiting or diarrhea to your doctor. These conditions cause you to lose body water and potassium, in addition to that lost by taking this medication.

HOW LONG SHOULD YOU TAKE THIS DRUG?:

1. Take this drug until your doctor advises you to stop taking it.

2. Take this drug even if you are feeling well and normal.

3. You may require this drug for the rest of your life to control your blood pressure. It is not a cure.

APPENDIX J

DIGOXIN MEDICINES

DIGOXIN MEDICINES

The drug prescribed for you from this 'family' of drugs is _____

You may also hear this drug referred to as a "heart pill". Your personal lowest pulse rate set by your doctor is _____ beats per minute.

NAME OF DRUG?:

HOW MUCH TO TAKE?:

HOW IT WORKS?:

- Your heart is a muscle that contracts and relaxes just like all the other muscles in your body. This medication increases the strength of each contraction and slows your heart rate, making each heart beat more efficient. The heart is able to fill with blood and then empty more completely causing you to have better circulation.

WHEN TO TAKE?:

1. Your doctor wants you to take this medication at _____

2. Try to take this medication at the same time each day.

3. Periodically check your pulse rate, at your wrist.

ANY FOOD OR FLUID CONSIDERATIONS?:

Although there are no considerations just because you take this drug, your doctor may have advised you about a special diet to follow because of your medical condition.

ANY ACTIVITY CONSIDERATIONS?:

Although there are no considerations just because you take this drug, your doctor may have advised you about an exercise routine because of your medical condition.

WHAT ABOUT TAKING OTHER MEDICATIONS?:

1. Do not take any other medications unless approved by your doctor. This includes medications prescribed by other doctors than Dr. _____

2. Do not take drugs or medicines that you buy at the drug store without a prescription (like cough medicine, laxatives, diarrhea medicines, antacids, etc.), unless your doctor has approved. Some could be dangerous in combination with this drug.

WHAT IF A DOSE IS MISSED?:

1. Do not take missed dose at all. Take pill at next scheduled time.

2. Never double your dose because you missed one pill.

ARE THERE ANY SIDE EFFECTS?:

1. Loss of appetite

2. Lower stomach pain

3. Nausea and vomiting

4. Unusually slow or uneven pulse.

5. Unusual tiredness or weakness.

WHAT SHOULD YOU DO IF YOU HAVE SIDE EFFECTS?

1. Report side effects that persist more than a few days to your doctor.

2. If your pulse falls below your personal pulse rate set by your doctor, call the doctor.

HOW LONG SHOULD YOU TAKE THIS DRUG?:

1. Take this drug until your doctor advises you to stop taking it.

2. Take this drug exactly as directed even though you feel well and normal.

3. You may require this drug for the rest of your life to <u>control</u> your heart rate. It is not a cure.

APPENDIX K

VASODILATOR/ANTIANGINAL

VASODILATOR/ANTI-ANGINAL

The drug prescribed for you from this 'family' of drugs is _____

You may also hear this drug referred to as an "angina pill" or a "heart pill".

NAME OF DRUG?:

HOW MUCH TO TAKE?:

HOW IT WORKS:?

1. Causes the muscles in your blood vessels to relax and let more blood get to your heart.

2. Works to prevent angina attacks which are caused by not enough blood getting to your heart.

WHEN TO TAKE?:

1. Your doctor wants you to take this medication at _____

2. After taking this medication for several weeks, do not stop taking it suddenly.

ANY FOOD OR FLUID CONSIDERATIONS?:

1. Take this medication with a full glass of water before your meal. It is most effectively absorbed if there is not food in the stomach.

2. Alcohol may make you dizzy or cause your blood pressure to fall, so check with your doctor before drinking alcohol.

ANY ACTIVITY CONSIDERATIONS?:

You may feel dizzy or lightheaded if you get up from a sitting or lying position too quickly. Get up slowly so your blood pressure can change from lower 'sitting down' rate to a higher 'standing' rate.

WHAT ABOUT TAKING OTHER MEDICATIONS?:

1. Do not take any other medications unless approved by your doctor. This includes medications prescribed by other doctors than Dr. _____

2. Do not take drugs or medicines that you buy at the drug store without a prescription (such as laxatives, cold medicine, antacids) unless your doctor approves. Some could be dangerous in combination with this drug.

WHAT IF A DOSE IS MISSED?:

1. Take missed dose as soon as possible, unless your next scheduled dose is within 2 hours.

2. Never double the dose.

ARE THERE ANY SIDE EFFECTS?:

1. Dizziness

2. Flushing face and neck

3. Headache
4. Rapid heart beat
5. Nausea and vomiting

WHAT SHOULD YOU DO IF YOU HAVE SIDE EFFECTS?:

1. Report any side effects that persist more than a few days to your doctor.

HOW LONG SHOULD YOU TAKE THIS DRUG?:

1. Take this drug until your doctor advises you to stop taking it.
2. Do not adjust your dosage or stop this drug suddenly without the doctor's advice.

APPENDIX L

ORAL HYPOGLYCEMICS

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The drug prescribed for you from this 'family' of drugs is _____

You may also hear this drug referred to as a "diabetes pill".

NAME OF DRUG?:

HOW MUCH TO TAKE?:

HOW IT WORKS?:

This drug stimulates your pancreas, the insulin producing organ in your body, to make insulin to keep your blood sugar in balance. As long as your pancreas can be stimulated to make enough of your own insulin to breakdown foods so that your body can use them, you don't need insulin by needle. This pill is NOT insulin.

WHEN TO TAKE?:

Your doctor wants you to take this medication one half hour before your regularly scheduled meals.

ANY FOOD OR FLUID CONSIDERATIONS?:

1. Food and fluids that are allowed on your menu that the doctor ordered, should be followed carefully. There are many choices in the food groups so you should select foods that you like, in the proper portions.

2. Do not go on a weight reducing diet without checking with your doctor.

3. Avoid alcoholic beverages unless your doctor says that they are allowed.

ANY ACTIVITY CONSIDERATIONS?:

Because the amount of calories that you get in your food and the amount of exercise that you do also affects the way your body balances the sugar level in your blood, it is important that diet and exercise instructions from your doctor be closely followed. If you have a big change in your eating or exercising habits, you should call your doctor.

WHAT ABOUT TAKING OTHER MEDICATIONS?:

1. Do not take any other medications unless approved by your doctor. This includes medications prescribed by other doctors than Dr. _____

2. Do not take drugs or medicines that you buy at the drugstore without a prescription (like laxatives, cold capsules, hay fever medicine), unless your doctor has approved. Some could be dangerous in combination with this drug.

WHAT IF A DOSE IS MISSED?:

1. Take the missed dose as soon as possible, if you have not eaten your meal yet. If you have eaten, do not take missed dose. Take next pill at regular time.

2. Never double the dosage ordered.

ARE THERE ANY SIDE EFFECTS?:

You might get symptoms of low blood sugar if you skip a meal or exercise too much or have vomiting or diarrhea. This is because you have taken a drug to stimulate your pancreas to make insulin and then have no food in your system for it to work on.

These symptoms are:

1. Anxiety/shakiness
2. chills
3. cold sweaty pale skin
4. drowsiness/tiredness
5. excessive hunger
6. headache
7. nausea
8. increased pulse rate

WHAT SHOULD YOU DO IF YOU HAVE SIDE EFFECTS?:

1. Eat or drink something with sugar in it right away - sugar cubes, sweetened orange juice, a chocolate bar.

2. Let your doctor know that this happened.

HOW LONG SHOULD YOU TAKE THIS DRUG?:

1. Take this drug until your doctor advises you to stop taking it.

2. The doctor will check your blood sugars by taking a blood test or he/she may ask you to test your urine on a regular schedule to see if you are producing enough insulin to use your food effectively. This is what he/she will use to figure out how much of the drug you need or if you need this drug.

APPENDIX M

ANTICOAGULANTS

ANTICOAGULANTS

The drug prescribed for you from this 'family' of drugs is _____

You may also hear this drug referred to as a "blood thinner" although it does not 'thin' the blood.

NAME OF DRUG?:

HOW MUCH TO TAKE?:

HOW IT WORKS?:

1. Interferes with the clotting of your blood so that harmful clots do not form in your blood vessels.

2. This drug only slows down or stops clotting but does not dissolve clots already formed.

WHEN TO TAKE?:

Your doctor wants you to take this medication at _____

ANY FOOD OR FLUID CONSIDERATIONS?:

1. Eat a normal balanced diet.

2. If you are unable to eat or have diarrhea for several days, notify your doctor.

3. Alcohol beverages could alter the way this medication affects your body, so you should check with your doctor about drinking alcohol.

ANY ACTIVITY CONSIDERATIONS?:

1. Avoid sports or activities where there is a chance that you could get hurt. Report falls, bumps to your body or head and injuries to your Doctor. This medication makes you bleed more easily - to the outside where you can see or to the inside where you can't.

2. Special care should be taken when shaving and brushing teeth so as not to cause bleeding.

3. If for any reason you have to see a Doctor or Dentist, let him/her know immediately that you take this medication. It is absolutely necessary to give this information. (A medic-alert bracelet or chain would be a good idea.)

WHAT ABOUT TAKING OTHER MEDICATIONS?:

1. Do not take aspirin (ASA) or any medication that contains (ASA). The combination of this drug and aspirin could cause bleeding to occur.

2. Do not take any other medications unless approved by your doctor. This includes medications prescribed by other doctors than Dr. _____

3. Do not take drugs or medicines that you buy at the drug store without a prescription (like cold tablets, pain pills, laxatives), unless your doctor has approved. Some could be dangerous in combination with this drug.

WHAT IF A DOSE IS MISSED?:

1. Take as soon as possible and then resume regular schedule.

2. If you don't remember dose until close to next pill time, do not take.

3. Never double the dosage as this could cause bleeding.

4. Keep a record of missed dosages and take to Doctor with you when he/she is testing your blood to see how fast your blood is clotting. (Blood tests done at regular intervals allow your Doctor to safety prescribe the amount of this drug that you need.)

ARE THERE ANY SIDE EFFECTS?:

1. Signs of bleeding inside body. these are:

   - pain in stomach
   - backache
   - bloody or black bowel movement
   - cloudy urine or blood in urine
   - coughing up blood
   - vomit that looks like coffee grounds
   - severe continuing headache
   - unexplained bruising.

2. Nosebleeds

3. Excessive bleeding or oozing from cuts.

WHAT SHOULD YOU DO IF YOU HAVE SIDE EFFECTS?:

1. Watch for signs of bleeding at all times.

2. Report any side effects to your doctor immediately.

HOW LONG SHOULD YOU TAKE THIS DRUG?:

1. Take this drug until your doctor advises you to stop taking it.

2. Take exactly as ordered - no more, no less!